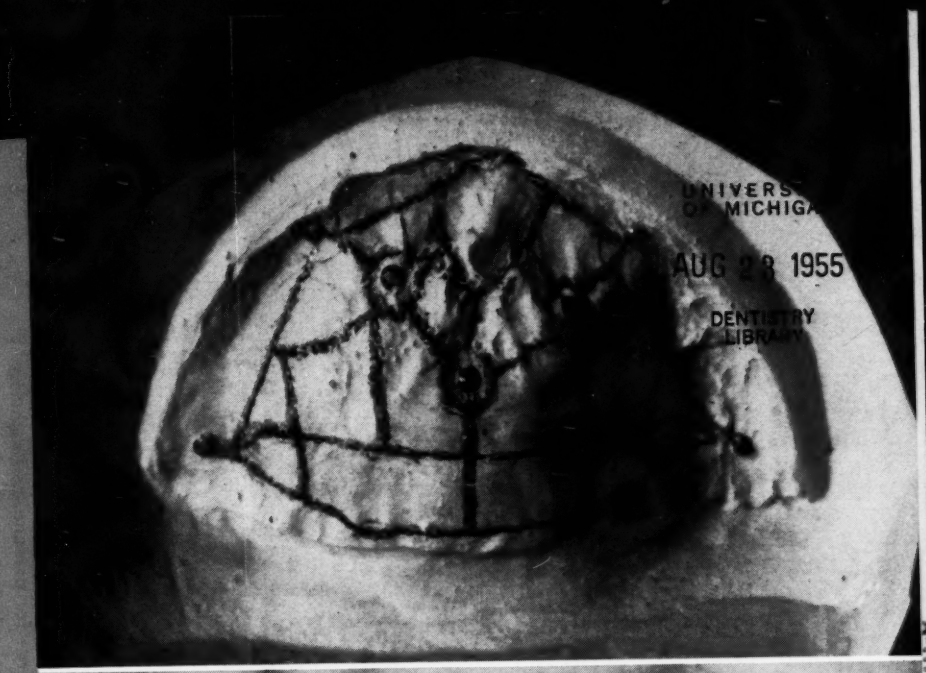
Dental Digest



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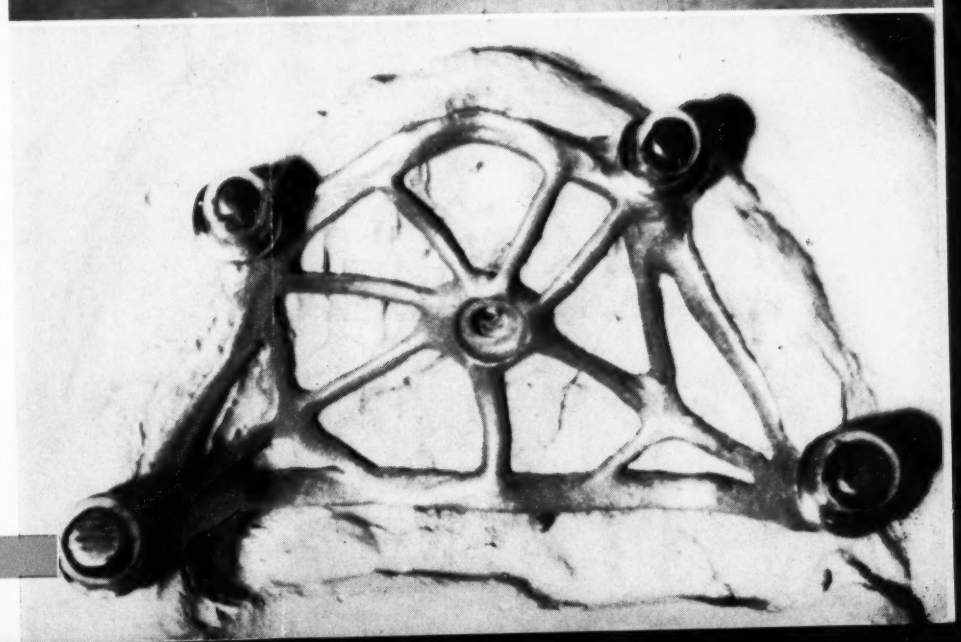

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FIVE

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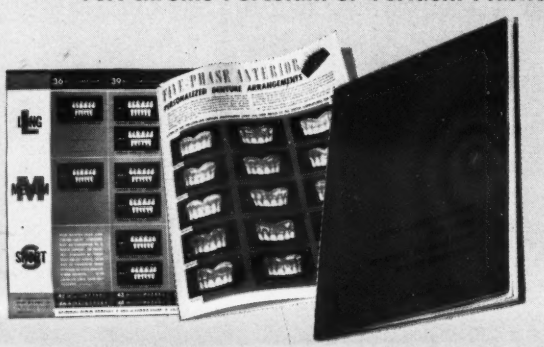

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Vol. 61, No. 8

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TRICHLRORETHYLENE

in Dental Practice

A. D. Faier, D.D.S., Omaha, Nebraska

DIGEST

Analgesia is one of the planes of the induction phase of all general anesthesias. Trichlorethylene analgesia may be defined as a diminished sensitivity to pain without the loss of consciousness. Trichlorethylene, known as Trilene® or Trimar®, is a potent analgesic agent which may be safely administered for operative dentistry or minor surgical procedures. This article evaluates trichlorethylene as an analgesic agent for use in all of the operative procedures performed during cavity preparation.

Loss of Pain Sensation

Analgesia, a state between consciousness and unconsciousness, may be described as a subconscious state in which there is a loss of pain sensation and memory, and a general numbness of the extremities; or, as an amnesic state without the loss of the sense of hearing. During this state the patient may move the arms or respond to touch without the stimulus of pain. Some patients can be controlled by being shifted into a slightly deeper phase of analgesia. Some do not require deeper analgesia. The arm movements of these patients can be controlled by a web strap placed around the chair and just below the elbow. The restraint is removed just before ending the analgesia.

Factors in Safety

Trichlorethylene is safe for analgesia without harmful effects. Possible side reactions or depressions occur only when the patient is carried to deep surgical anesthesia. If the typical signs of anesthesia are noted, the patient will not be taken beyond the plane of safety into surgical anesthesia as this depth of narcosis is unnecessary for operative dentistry as a rule. About 90 per cent of all patients treated under trichlorethylene analgesia were good subjects. An estimated 10 per cent or slightly less were poor subjects for analgesia because it was difficult to maintain them in the analgesic plane. These patients are inclined to enter the second or excitement plane in which they become restless and respond to a stimulus or even the sound of the motor or handpiece. They should be treated under local anesthetics or under complete anesthesia.

Advantages of the Agent

1. Trichlorethylene is nonflammable. As used in analgesia and anesthesia it is effective in small amounts. When administered over a long period it becomes accumulative.

2. There is little postoperative disturbance, nausea and vomiting are uncommon, and recovery is pleasant without long periods of after effects. Patients are kept in the office for periods of 20 to 30 minutes, depending on the duration of analgesia.

3. The agent is relatively nonirritating and pleasant to inhale. After four or five breaths the patient becomes less sensitive to the vapor, especially if analgesia is induced slowly.

4. Besides its analgesic and anesthetic properties, trichlorethylene produces amnesia which is a distinct advantage. Although the patient may experience discomfort he will have no memory of it.

5. Good operative procedures are not sacrificed as the rubber dam should be used. The rubber dam provides a clean dry field and also prevents mouth breathing.

6. Several cavities may be treated at the same sitting without inconvenience to the patient.

7. In dentistry general trichlorethylene analgesia is adapted to the following situations:

(1) For patients who fear local anesthesia and the needle.

(2) For those who dislike the prolonged paresthesia that follows the use of local anesthetics.

(3) Those who wish to be unaware of what goes on about them.

(4) For the nervous and apprehensive patient.

Disadvantages

The disadvantages of trichlorethylene in general analgesia are few:

1. The addition of more apparatus such as the nasal inhaler.

2. The subconscious patient may drift to light anesthesia and require attention.

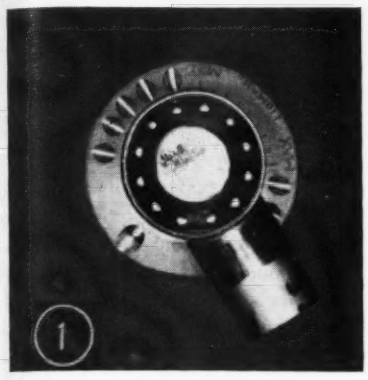
3. About 10 per cent or less of patients are not suitable subjects for analgesia because they are difficult to control in a subconscious state.

4. There is a period of drowsiness during recovery which may vary from 20 to 30 minutes, depending on the length and depth of analgesia. In the use of local anesthetics containing adrenalin or similar vasoconstrictors cardiac arrhythmias may be produced.

Trichlorethylene and Adrenalin—Ostlere[1] states:

"I have never seen ill effects from combining the two drugs, and Hutchinson reports 'several thoousand'

[1]Ostlere, Gordon: Trichlorethylene Anesthesia. Baltimore, The Williams & Wilkins Company. 1953.



1. ***Dial on Cyprane Inhaler.***

cases in which they were given together without harm. Auricular fibrillation under trichlorethylene anesthesia has been reported after infiltration of the neck with a dilute solution of adrenalin, but in this case an overdose of adrenalin was given."

Conditions Observed—An increase in the salivary flow during cavity preparation has been noted by the author. This was overcome by the use of the rubber dam and premedication with atropine, 1/150 grain.

Apparatus

Two types of apparatus for the administration of trichlorethylene for analgesia are available:

1. A self-administering apparatus known as the Duke Inhaler.

2. The Cyprane Inhaler which is controlled by the operator.

The Duke inhaler was used by the author for about three months. His experience was that analgesia could be produced with the apparatus but that it was impossible for the patient to be maintained in a smooth analgesic plane. As the patient became drowsy, control was lost and the patient shifted from too light to deep analgesia and eventually became unconscious. With this instrument the analgesic state was too uneven. With the Cyprane inhaler the patient can be carried safely to the analgesic plane and manitained at an even plane of analgesia which the operator can control.

Premedication

The following factors have been observed in the use of sedatives:

1. Premedication is as a rule not advantageous as it tends to give the patient a longer recovery period. Without medication the patient recovers more quickly and can be dismissed sooner. Seconal® or Nembutal®, however, may be used in doses of ¾ or 1½ grains 90 minutes before analgesia.

2. Atropine, 1/150 grain, may be desirable for patients subject to excessive salivation, or for those with postnasal complication. Otherwise, premedication is unnecessary.

Steps in Induction of Analgesia

1. Before the patient is subjected to general analgesia he should be informed briefly of the symptoms or reactions to be expected during the induction. This will result in a calm cooperative patient.

2. As the analgesia progresses the patient should be spoken to in a soft voice and confidence should be instilled.

3. The patient is told that the analgesic vapor he is to breathe is pleasant and relaxing. He will experience a feeling of well-being and exhilaration (euphoria).

4. There will be a tingling numbing sensation in the hands and toes but the sense of hearing will not be lost and at intervals the dentist will speak to the patient.

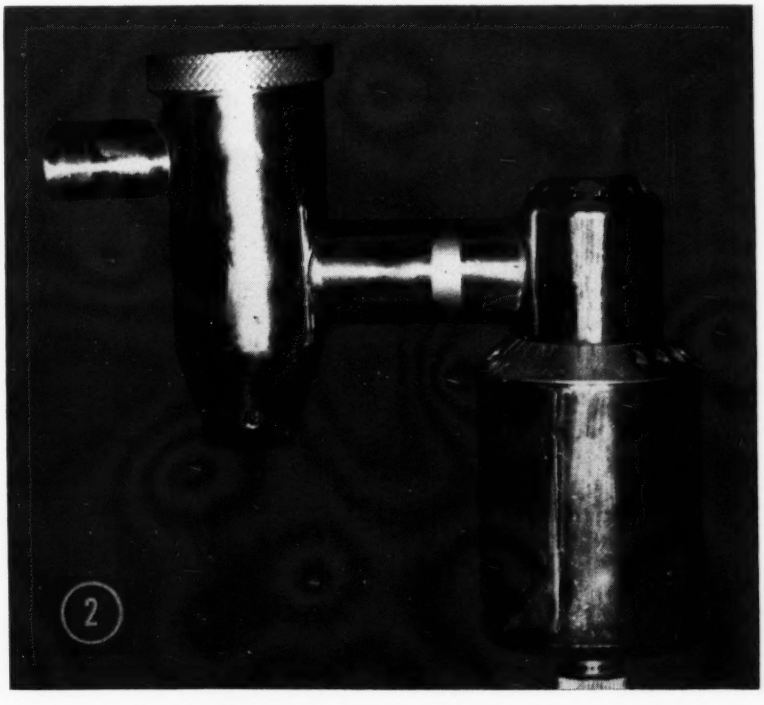
5. After analgesia is induced and the patient reaches the stage of relaxation and tingling of the extremities, he must rely on the operator for further control.

Signs of Analgesia—As analgesia is continued the eyes take on a glassy appearance, the face may become somewhat flushed and perspiration may be profuse. At this point the rubber dam may be adjusted. The placing of the clamp without response from the patient indicates satisfactory analgesia. If it is impossible to adjust the dam, the oropharynx may be covered with a gauze pack. The following purposes will be served by the gauze pack:

1. The patient is obliged to breathe through the nose as the nasal inhaler is used.

2. Debris is prevented from clogging the throat and causing inconvenience.

3. A clean dry field is supplied; after the dam or sponges are placed the operator may begin cavity preparations.



2. ***Cyprane Inhaler and nonreturn valve attachment.***

3. ***Shows rubber dam and inhaler in place.***

Degree of Analgesia May be Altered—If the patient flinches during treatment it is possible that the analgesia is not deep enough. The dial setting on the Cyprane inhaler may be advanced one setting. Wait six or eight breaths and then resume therapy. As analgesia progresses, the patient may become deeper in analgesia. In this case turn the dial setting back. If the patient lifts the head or moves the arms or legs he is entering the excitement state. Anesthetic should be lightened or the Cyprane inhaler only (not the nasal mask) removed and the patient permitted a few breaths of air until he can respond to the operator's voice. The inhaler is returned, set at a lower point, and analgesia is continued. Occasionally, the patient will drift from the analgesic plane into light anesthesia or first plane anesthesia.

Shift to First Plane Anesthesia—In this stage the patient does not respond when spoken to. He becomes completely relaxed and quiet with rhythmic breathing. The eyes may oscillate slightly or be fixed off center. It is not desired to maintain the patient in surgical anesthesia. The dial is therefore set back to zero; or the inhaler is removed until the patient returns to analgesia.

Average Time of Duration—Analgesia may be continued for any reasonable length of time. Most of the author's cases are maintained from 30 to 90 minutes. In this time much can be accomplished and the operator may treat any or all quadrants of the mouth. The longer analgesia is continued, the less of the drug is required. Although the incidence of nausea is slight the patient may be requested to omit breakfast if he has a morning appointment or omit lunch if he has an afternoon appointment.

Use of Motion Drug—Patients that have experienced nausea previously and who wish analgesia again are generally given one of the antimotion sickness drugs. Bonamine®, 25 milligrams, one tablet, is used either in the morning or the night before, depending upon the time of the appointment. This dose may be doubled if necessary to 50 milligrams.

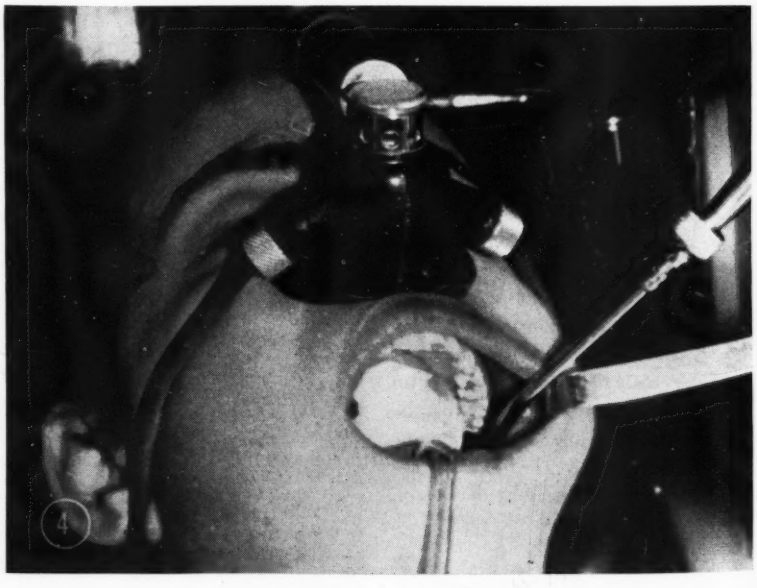
Series of Cases Reported

The report presented herein is based on a series of 260 cases of general trichlorethylene analgesia. These were performed in the author's personal practice of general dentistry. The following results were recorded:

1. Of the 260 patients in which trichlorethylene was administered as a general analgesia, 11 patients became nauseated.

2. Of the 11 patients three became nauseated because they disregarded the directions relative to omitting the meal before the appointment time.

3. A group of 16 patients reported that they felt some pain but not of any consequence. It is thought that some of these patients were kept in too light an analgesic plane. Some of these pa-



4. ***Analgesia with a local anesthetic. Throat packed with gauze preparatory to extraction.***

tients were treated in the early part of the series and feeling response was no doubt due to a lack of experience and timidity in the use of the agent which was overcome by experience.

4. The patients reported were of age groups ranging from children of 4½ years to adults of 55 years. All treatment was operative dentistry.

Summary

Trichlorethylene is a safe and pleasant analgesic drug. It is nonflammable and has a pleasant smell. In small concentrations it produces effective analgesia and it is useful for the maintenance of light narcosis. It causes little postoperative disturbance and has no toxic effect.

It is effective in small quantities and has quick recovery. It can be administered easily by the operator in general dentistry. Trichlorethylene makes it possible to treat any quadrant of the mouth without inconvenience to the patient. It is readily accepted by adults and children.

1102 *Medical Arts Building*

The Porcelain Jacket Crown

Joseph E. Ewing, D.D.S., Philadelphia, Pennsylvania

Copper Band Technique

1. Make every effort to avoid making the same impression repeatedly. Such a procedure will not only cause excessive thermal shock to the tooth, but also will injure the soft tissue.

2. Select the proper size band. Too large a band will fold the interproximal tissue over the shoulder, thus producing a distorted impression, and also laceration of this tissue. Too small a band will not be large enough to secure a complete impression. In band selection, choose one which fits the preparation rather tightly, then use the next size larger.

3. All bands must be properly festooned to conform to the gingival outline or curvature of the preparation.

4. Trying bands on the tooth repeatedly is undesirable, since this may injure the soft tissue attachments. Use the dentimeter gauge to determine the approximate size, and then follow the suggestions as outlined in 2 above.

5. Always, after trimming and festooning a band, smooth and polish all rough edges with sandpaper discs or a small file. This will prevent soft tissue injury.

6. Select a band which will permit a uniform thickness of impression compound over the axial surfaces and one which will be long enough incisally to ensure sufficient thickness for strength during the die construction.

7. Lubricate all preparations preparatory to impression making. This not only serves as a protection for the dentinal tubules, but if there are any restorations present, it will prevent them from being pulled out upon removal of the compound impression.

8. Do not exert *excessive pressure* during impression procedures. Such pressure can easily detach the gingival tissue. Such injury is not apparent, at first, but after six months to one year, the tissue will become flabby, recession will occur, and discoloration will become evident at the gingival area. These things can easily be avoided if just a little care is taken during this step of the procedure.

9. Whenever possible, select and fit the copper band prior to the preparation of the shoulder. Such a procedure will simplify your selection, and the resulting impression technique will become much easier.

10. Thoroughly chill all impressions with ice water prior to their removal from the preparation. This will ensure a more accurate impression.

11. Mentally record the long axis of the completed preparation, and endeavor to remove the impression in a direction parallel to this long axis.

12. Avoid excessive buccolingual movement during impression removal, for such movement will cause distortion. The impression should be removed with a continuous, steady, vertical pressure away from the gingiva.

13. Do not overfill the copper band with compound. Such compound when forced gingivally past the shoulder may cause soft tissue detachment, and upon removal, even if it breaks clean, will produce a slight distortion.

14. Overheating of compound not only destroys the desirable properties of the material, but also produces thermal shock to the tooth. Heat the compound according to directions.

15. Always sear the compound to the gingival edge of the band by means of dry heat. This will prevent the compound from pulling away from the edge of the band, thus avoiding distortion.

16. Take the "spring" out of the copper bands by either completely or partially annealing them.

17. Cut an "X" or some type of identifying hole in the labiogingival area, and this will permit the escape of excess compound, relieving to a degree some of the exerted pressure. Such a marking will also serve as a means of identification of the labial surface, and confusion will be avoided at a critical time during impression making, and later during certain laboratory procedures.

18. The last point, but not the least in importance, is the fact that prior to impression technique the preparation must be thoroughly clean of all debris. This may be accomplished by making a "trial" tube impression of the preparation. Such an impression does not have to be fully seated in order to thoroughly clean the preparation. Examination of this impression may also reveal the accuracy of the festooned copper band which will greatly aid if correction, such as an an overextension, is present.

From *Journal of Prosthetic Dentistry* **4**:97-98 (January) 1954.

ACKNOWLEDGEMENT

The abstract on page 237 of May DIGEST was taken from an article written by Joseph E. Ewing, D.D.S., Professor of Crown and Bridge, Temple University School of Dentistry. We regret that we did not give credit to Doctor Ewing as the original author.

OCCLUSAL MOVEMENTS *and* OBSTRUCTIONS:

the Bennett Movement – Part One

Harry L. Page, Valparaiso, Indiana

DIGEST

Concern over centric relation, lateral motions, condyle paths, protrusive check bites, and related concepts has diverted attention from an appreciation of the kinematics occurring at or forced upon the occlusals, the working section of the jaws.

This article (1) stresses the difference between condylar and occlusal movements and controls, (2) explains why emphasis upon laterals is a mistake, (3) shows that temporomandibular joints do not control jaw motion, and (4) demonstrates that the Bennett movement is a component of vertical instead of lateral motion.

This article is presented in two installments.

Condylar vs. Occlusal Movements

In conventional articulation the theory and technique of condylar centric relation and condyle path concepts have been so absorbing that the significance of the difference between the type of movements occurring at the condyles and those occurring simultaneously at the occlusals has been overlooked. What is taking place at the occlusals must be understood because the occlusals comprise the working part of the jaw. It will be useful, therefore, to separate condylar from occlusal movements and study them.

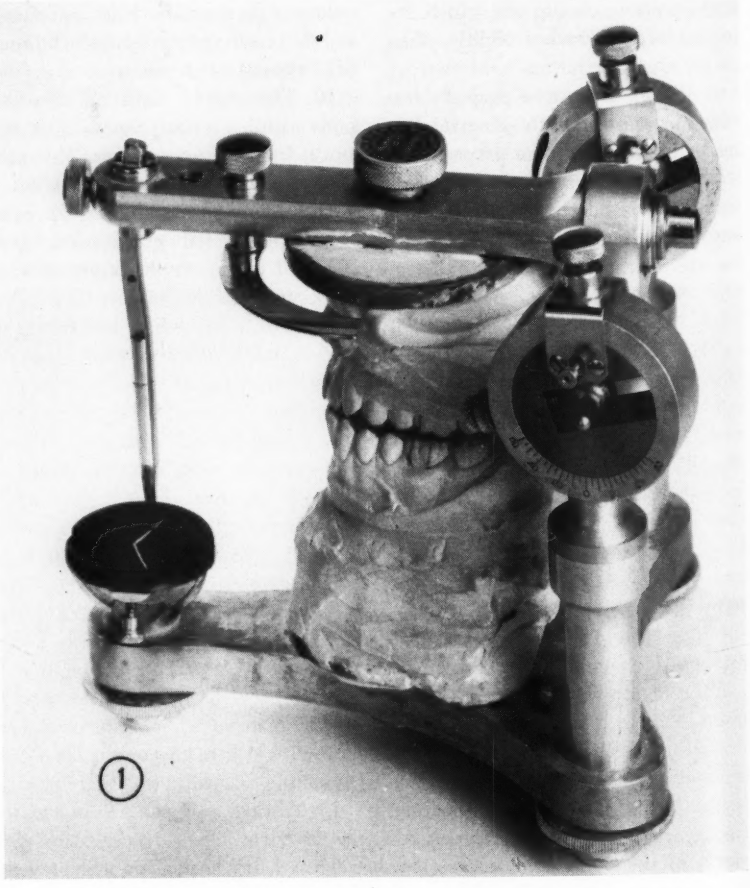
Ideal Situation Assumed—Assume initially that the condyles remain in their fulcral or hinge positions and that the teeth interdentate in perfect hinge occlusion. Assume further an ideal situation wherein the jaw opens and closes on its hinge-axes without any deviation from the midline and without any Bennett movement:

(1) As the jaw opens, the condyles continue to maintain hinge position, showing rotary motion only while the condylar hinge-axes remain motionless.

(2) Having opened the jaw in this ideal manner, let us close it. Again the hinge-axes continue motionless as the condyles rotate back to their original relationships in their respective fossae.

But what is happening to the body of the mandible and to the occlusals during this condylar function?

Translational Movement Engaged—As the condyles rotate and the hinge-axes spin, the occlusals engage in an entirely different type of motion. Since an ideal situation is assumed involving (1) no translatory condyle movement, (2) no deviation from the



1. ***Condyle slots set at 20°. Incisal tracing made.***

midline, and (3) no collaterals in the transverse or horizontal planes, the teeth move through a uniform arc lying in one sagittal plane only. But, *and here lies the difference;* the teeth are engaging in a movement that is neither rotary nor hinge as at the condyles but is *translational.*

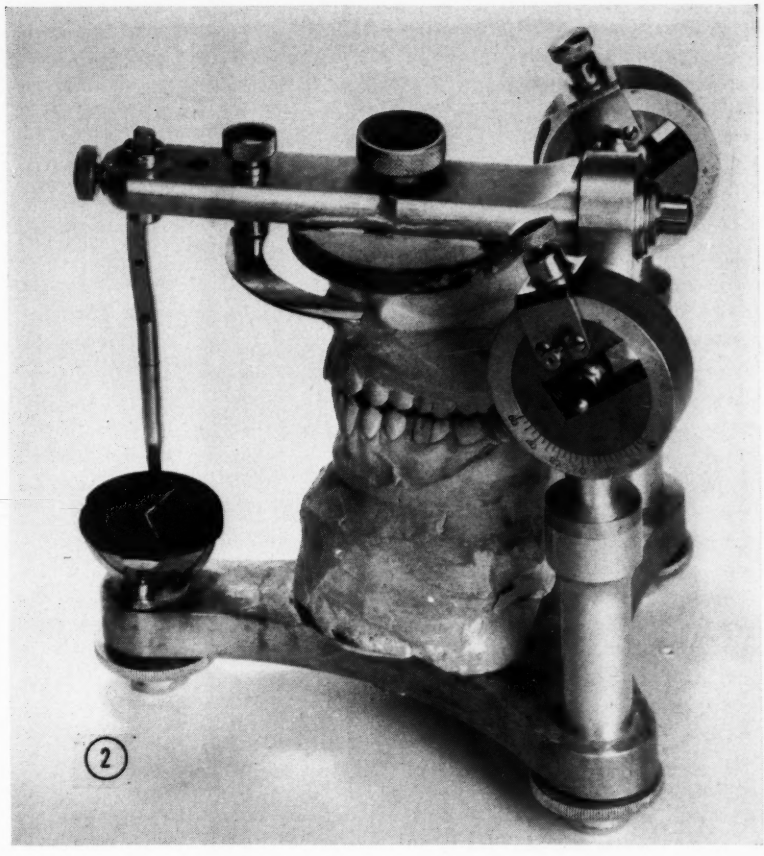
Occlusal Pathways—The teeth follow an arc that travels downward and, what is far more important in articulation, one that travels backward. This occurs during the opening movement. In the closing movement, the body of the mandible reverses the procedure with the translational movement arcing upward and forward.

Position Shift in Two Planes—While the condyles maintain a constant position in their respective fossae (let it be called "centric relation" or "the most retruded position" if desired) the working portion of the jaw, the mandible, is shifting its position bodily in two planes: the horizontal and the sagittal.

Normal Situation Assumed—Departing from the ideal situation described and tending to the normal wherein the jaw not only displays deviation from the midline but also a collateral or Bennett movement as it opens and closes, the difference between the "retruded" condyle *positions* such as "centric relation" and the *translational movements* of the lower alveolus becomes even greater for mandible movements in the third or transverse plane have been added.

Incorporation of Chewing Movements—Finally, when chewing movements are incorporated to complete the synergy, it becomes forcefully apparent that the type of movement at the occlusals must be treated apart from mere condyle positions or paths in the temporomandibular joints.

Centric Relation not the Key to Articulation—It does not suffice to hold "centric relation" to be the key to all articulation. Centric relation may be impressively defined as "The most retruded position of the condyles in their fossae," and the condyles may actually retain this "most retruded position" as the jaw opens or closes in function but the lower alveolus and the occlusals *do not.*



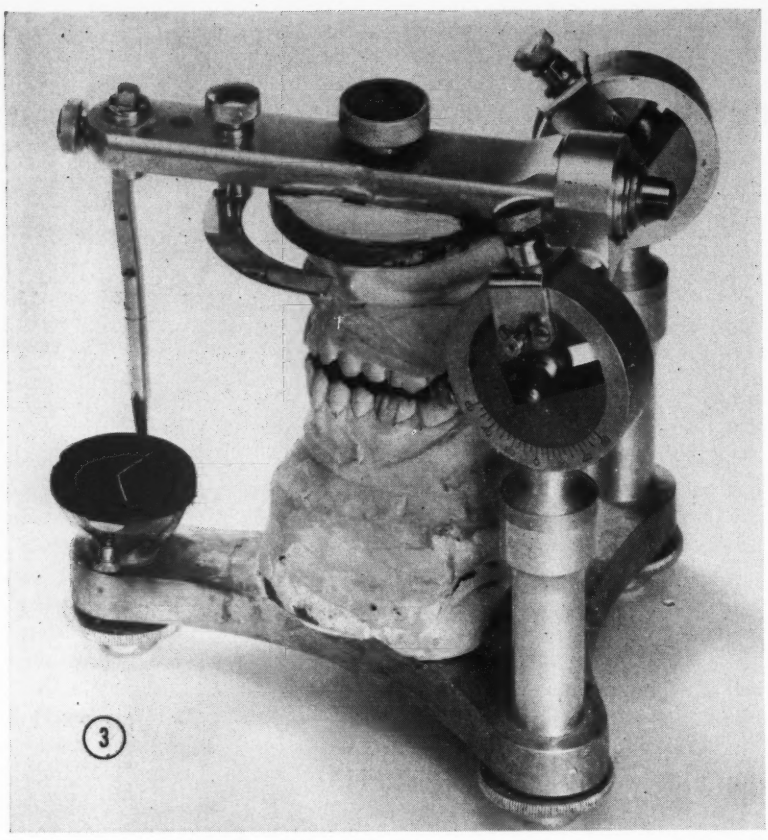
2. ***Condyle slots changed to 40°. Incisal tracing unchanged.***

Degrees in Retrusion Maintained—As mouth opening begins, the working part of the jaw, the mandible body, drops *behind* its supposedly "most retruded position" and remains in varying degrees of *retrusion* throughout normal function no matter what positions may be assumed by the condyles along the fossal slopes. If there is anyone who can function without first opening his mouth, he is yet to be found.

Functional and Lateral Movements Unrelated—When conventional *lateral* motions are made in an attempt to articulate teeth, determine "condyle paths" or "balance" an articulation, *occlusals do not retrude as in function.* Instead, they immediately move into and remain *in protrusion.* Lateral movements and functional movements can coincide only when the occlusals are *motionless and in hinge occlusion.* Since all jaw movements (functional or lateral) finish at this point, it will be seen that functional and lateral movements occur in different fields having no relation to one another. This means that laterals are completely outside of functional range while condyle paths are of no importance.

A New Rationalization on Lateral Motions

As it becomes more generally understood that lateral motions are outside of functional range and that condyle paths are unimportant, many who have put years of faith in an assumed functional value of these laterals and paths have not abandoned them but have only changed their reason for using them. Essentially, this new rationalization agrees that laterals are worthless functionally but elevates bruxism and bruxomania to



3. ***Right condyle slot changed to 60°, left to 30°. Incisal tracing unchanged.***

the status of virtues where once they were injurious and factors to be eliminated by every possible means.

Proposed Means to Relieve Nervous Pressure—It is now contended that we are highly nervous people living in an era of hypertension and that we must have a method to reduce the pressure. It is also claimed that we masticate only one hour a day but that we "doodle" with the teeth the remaining twenty-three. The remedy suggested in both cases seems to be freedom to make lateral movements with the teeth clenched.

Freedom in Lateral Movements Recommended—It is recommended that articulation procedures continue to reduce and abort the teeth from natural cuspation in such a way that they may be clamped, ground, slid, and "doodled" freely. Fear is expressed that, lacking this lateral freedom, patients may damage their mouths "in a few years."

Natural Articulation Destroyed—To recommend freedom for bruxomatic lateral movements appears to make no more sense than daubing molasses on an infant's thumb so he will be sure to develop the bad habit of sucking it. Furthermore an articulation prepared according to lateral motions will, *per se*, destroy any semblance of true articulation and will prevent proper contact between the posterior teeth in simple closure.

Damage from Erroneous Concepts—It is unnecessary to await with apprehension for possible damage "in a few years"; damage has already been done by these erroneous concepts and will be present from the beginning. The logical remedy would seem to be to articulate the teeth naturally. There is ample evidence that people with naturally articulated teeth cease to "doodle." They do not need, nor do they seek lateral freedom and they possess comfortable, efficient occlusion and articulation that will continue indefinitely.

Center Bearing Pin and Plate—Occlusal Obstacles

Little thought has been given to the possible harmful effect of installing a center bearing pin and plate in the patient's mouth for the purpose of facilitating lateral movements. With the insertion of such a pin and plate, the functions of the masseter, the anterior part of the temporal, and the closing segment of the internal pterygoid have been removed from the closing synergy.

Effective Movements Limited—With the use of the center bearing pin all true closing muscles have been eliminated. This means that the only functional components remaining are the ones created by the medial pull of the working internal pterygoid and the posterior pull of the nonworking temporal. Therefore, the effective movements of a jaw that attempts functional closure will be limited to the medial and retrusive laterals.

Significant Functional Movements Absent—It can readily be seen that this situation permits no movements related to or significant in function. Under such handicaps what purport to be condyle and Bennett paths are meaningless no matter how carefully and scientifically they may have been recorded.

Identical Tracings of Artificial Movements—That these movements may repeat themselves exactly and several pantographic tracings of them may be superimposed and proved identical does not mean that they portray and prove function; it demonstrates only that they are identical tracings of identical artificial movements forced upon the helpless condyles by identical obstructions; that is, the pin and plate.

Condyle Movement Dictated by Pin and Plate—When radial laterals (outward and protrusive movements) are used to record the supposed condyle and Bennett paths, there will be no closing muscles at all in operation. This time the tracings will be a product of the external pterygoid on the nonworking side only, with the pin and plate again dictating the type and path of condyle movement.

Movements Outside Functional

Range—This is even farther from functional closing jaw synergy than before for the external pterygoid is a mechanism of the *opening and protusive* movements only; movements that, like the medial laterals, are completely outside of functional range. The belief that a true envelope of motion can be obtained from these radials is hopelessly untenable. Instead of an envelope of functional motion, the result is a recording that is wholly *distal to function.*

Lateral Motions Assumed Components of Correct Articulation—Despite the fallacy inherent in its execution, there is a commendable purpose behind the conventional use of the center bearing pin and plate. It has been honestly, if erroneously assumed that lateral motions were important components of correct articulation. In the dentulous case these could not be pantographed until cuspal interferences had been eliminated. The center bearing pin and plate with a jack screw provided means of governing the amount of closure and thus prevented the patient from interdenting his teeth. Free, unhindered laterals were thereby made possible.

Use of Mechanism in Edentulous Case—In the edentulous case the pin and plate mechanism was employed to maintain a supposedly constant vertical dimension and what also purported to be an even bearing on both ridges while writing a gothic arch tracing for the purpose of locating "centric." The center bearing pin and plate have also found sporadic endorsement for "milling" artificial teeth into so-called "balance."

Results of Unsound Premise—Unfortunately, none of the premises is sound and as so often happens, "What is seldom recognized is that, while the reasoning may be valid, invalid premises lead logically and inexorably to invalid conclusions."[1] The truth of this statement has been confirmed by consistently unsatisfactory results.

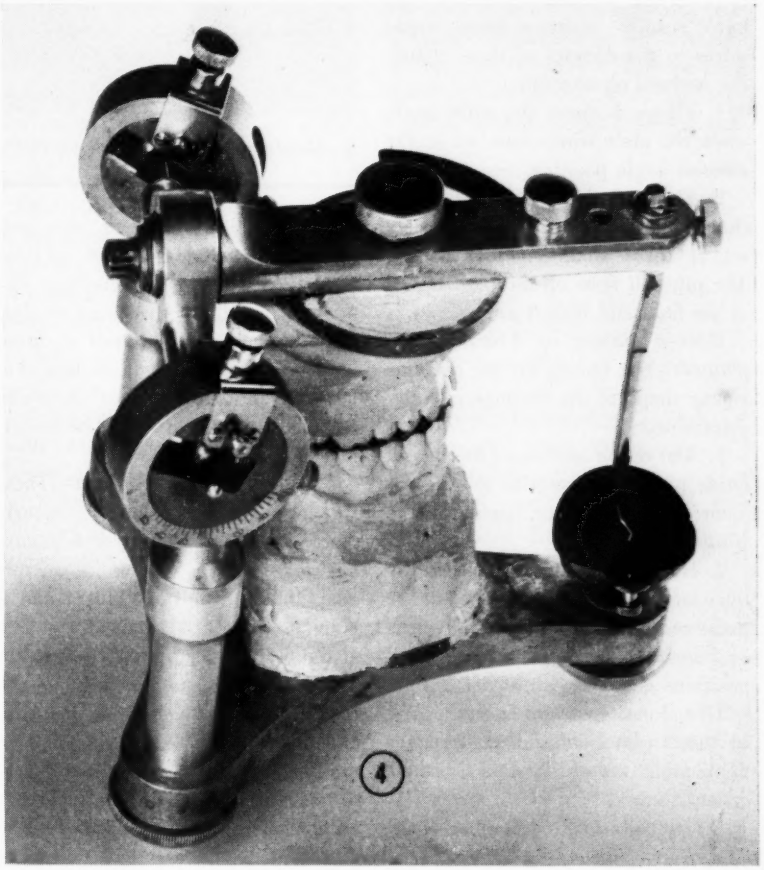
Condyles Adapt to Occlusal Obstruction—The proved fallacies of condyle paths, balance and the gothic arch tracing have no place in this article for they have been discussed adequately elsewhere. The interest here concerns the value or lack of value of the center bearing pin and plate. It is unnecessary to make intricate experiments to arrive at a conclusion. It is only necessary to realize that the translating condyles are universal joints and as such will adapt themselves to any occlusal obstruction such as the center bearing pin and plate. If, however, visual proof is desired, it will be found in Figures 1 to 6.

Condylar Adaptation Visualized

In Figure I the articulator condyle slots have been set at 20°. The incisal guide plate is set flat, representing and duplicating the role of the plate in the patient's mouth while the incisal guide pin, locked in a position that prevents occlusal contact, represents the center bearing pin. With either condyle released, the nonworking or translating condyle (the one that moves along the condyle slot and follows the assumed head condyle path) is a universal joint capable of complete rotary and almost complete translational adaptability in all three dimensions simultaneously.

Versatility of Movement—In this respect the nonworking articulator condyle duplicates the nonworking head condyle except for the degree of adaptability. In the head the condyle is more versatile, being able to alter its path as well as its type of movement to accommodate for occlusal obstructions. In the articulator, the condyle balls must follow the slots.

Laterals Made in all Degrees—Laterals have been made in Figure I as shown by the tracing on the incisal guide plate. In Figure 2, the condyle slots have been changed to 40°. Again, laterals have been made. Note



4. Condyle slots at 30°. Incisal plate wings at steepest angulation. Note zigzag tracing.

[1]Abrahamson, E. M., and Pezet, A. W.: Body, Mind and Sugar, New York, Henry Holt and Co., 1951, p 28.

that there has been no change in the paths traced by the incisal guide pin. In Figure 3, the left condyle slot has been set at 30° while the right condyle slot has been set at 60°. There is still no difference in the paths followed by the incisal guide pin.

Condyles Operate as Universal Joints—It begins to be evident that the pin and plate (representing the center bearing pin and plate in the mouth) are dictating the paths at the occlusals and that the translating condyles are operating as universal joints and are adapting themselves to the forces sent from these occlusal obstructions.

Condyles Accommodate to Changing Obstructions—In Figures 4 and 5 the condyle paths have been left constant at 30° but the incisal guide plate angulation has been altered three times in addition to an original setting. The path followed by the pin differs widely in all four settings showing that the translating condyles have readily accommodated themselves to the dictates of these changing occlusal obstructions:

1. Figure 4 shows the paths made when the plate wings were set at the steepest angle possible.

2. Figure 5 shows the three additional paths traced as the wings were set at three shallower angulations. The pin still rests on the path traced at the final and flattest angle.

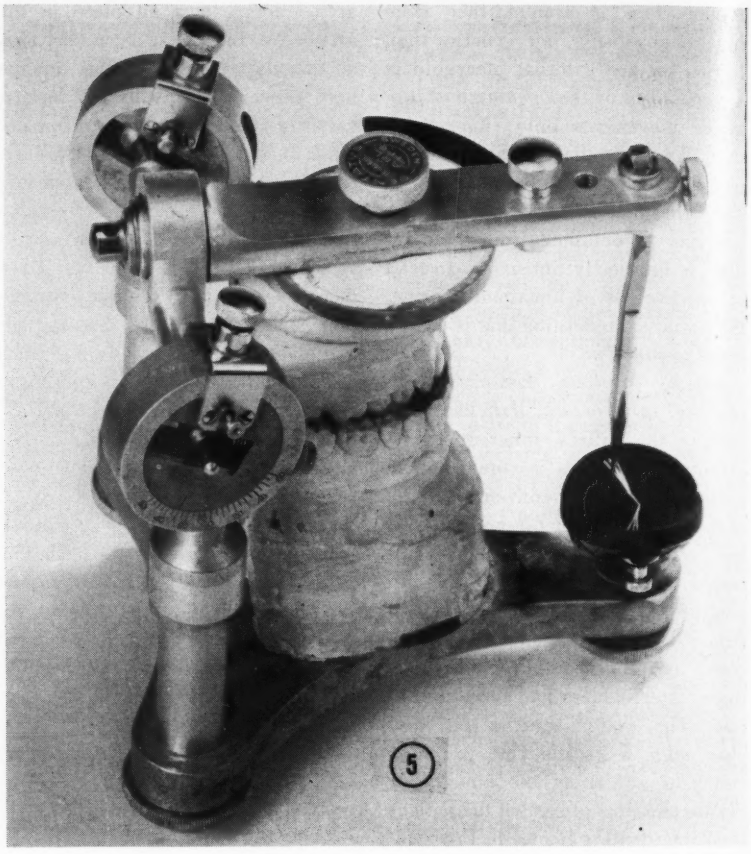
Uneven Shape of Tracings Explained—The reason for the peculiar zigzag shape of the tracings is easily determined:

1. The center section of the incisal guide plate is constant in this instrument; only the outer parts of the wings are movable.

2. Hence the paths controlled by the center section do not vary but the paths controlled by the movable parts of the wings change as the outer wing positions change.

This situation should be interesting to those who believe that they are duplicating *mouth* laterals in their articulation.

Lateral Motions Attempted with Teeth in Occlusion—In Figure 6, the casts of this patient who is fortunate enough to have an unblemished set of perfectly articulated teeth were permitted to occlude. Lateral motions were then attempted. Note that (1) not only has the nonworking condyle submitted and adapted itself to cuspal interference at the left molars, but (2) conventional "balance" is totally lacking. This is as it should be in normal dentition.



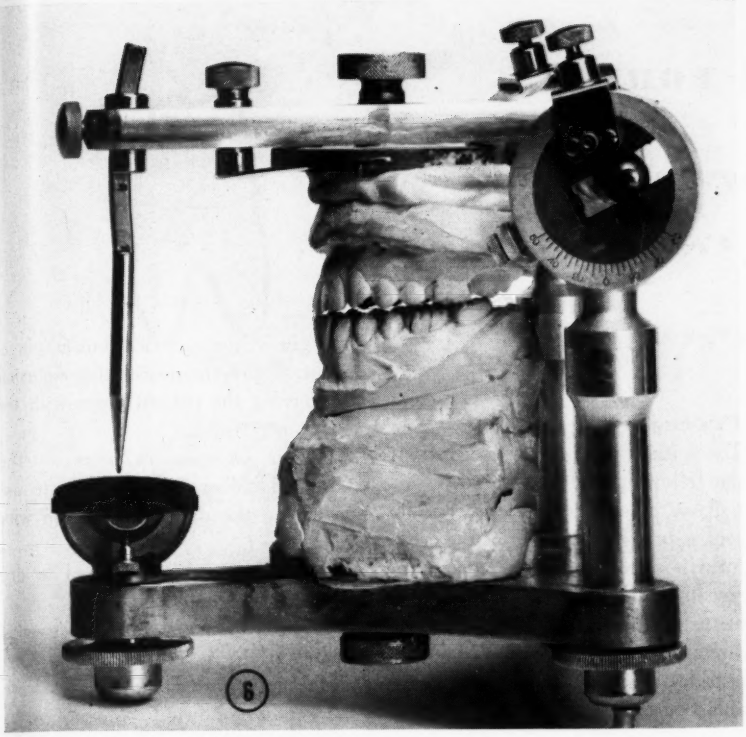
5. ***Condyle slots unchanged. Condyles dominated by changed plate angulations.***

Former Theory Refuted—These simple experiments indicate clearly that *the temporomandibular joints are not jaw controls:* they are merely adaptable and movable fulcra and it is the presence or absence of obstacles at the occlusals, modified or accentuated by muscle and working condyle restrictions, that determine the condyle *paths*. To those who assert that the Bennett movement is a major part of the condyle path and that it occurs only in lateral motions, this should be revealing. In this case it is no longer possible to believe of the Bennett movement that "Since it is the power movement, it is the most important of the mandibular synergy." No longer can the theory that "When disharmony exists between the teeth and the joint there is a constant struggle . . . between the two. Usually the joint wins the battle . . . with the subsequent loss of the teeth," be accepted.

Strain on Fossa Prevented—The contrary is true: either condyle, while in translational motion, like any universal joint, conforms to interferences at the occlusals. It "rolls with the punch," thereby preventing strain and trauma upon the fossa and saving the temporomandibular joint from injury. This leaves the "battle" to the musculature and the teeth with the latter on the losing side.

Fallacy of the Protrusive Bite

A protrusive bite is standard procedure in determining and transferring supposed condyle path inclina-



6. ***Condyle slots unchanged. Condyles dominated by cuspal interference.***

tions to an articulator. A protrusive is thought to slide the condyles downward while in contact with the fossae and to produce paths representing the fossal inclines. This is not true nor could these paths be utilized if it were.

Recording Incorrect — The condyles are universal joints and will adapt themselves to any change in the hardness or thickness of the recording wax or the tooth position in it. No two recordings could be the same except by accident. Since none is the same, the only safe conclusion must be that none is correct.

Effect of Protrusive Jaw Movements on the Condyles—Any attempt to determine a lateral protrusive articulator condyle path from a straight protrusive jaw movement will also result in failure. Straight protrusive and lateral protrusive jaw movements cause the condyles (which are also grossly asymmetrical) to pass over and contact quite divergent types and inclinations of fossal slopes.

Duplication of Angle Impossible—Presumably, every dentist understands that the sole purpose of recording head condyle path inclinations is to attempt to duplicate the angle between them and the head occlusal plane in the articulator. But even if a correct condyle path to occlusal plane relationship could be established by a protrusive bite, there would be no way to repeat it in any popular conventional articulator.

Condyle Paths Impossible to Record—The fossal slopes that determine condyle paths in the head are part of the cranium (the upper) while the instrument condyle slots are part of the *lower* articulator frame (the lower). This difference makes it impossible to mount or maintain correct head condyle path angles or true kinematic relationships of any off-sagittal-plane-functions. The use of a so-called "orbital indicator," becomes a futile attempt under these circumstances.

104 *Garfield Avenue*

(End First Installment)

[2]Granger, Ernest R.: Centric Relation, J. Pros. Dent. **2**:169 (March) 1952.
[3]Ibid.: Functional Relations of the Stomatognathic System, JADA **48**:640 (June) 1954.

Preanesthetic Medication

IN SUMMARY, narcotics are necessary in preanesthetic medication in the infrequent circumstance in which patients are in pain in the period immediately preceding anesthesia. For the typical case the oral use of a hypnotic to promote a good night's sleep before surgery and again early on the morning of surgery is desirable. But the final preanesthetic medication has been shown best to fulfill the goals when it consists of a barbiturate (instead of a narcotic) given intramuscularly along with atropine.

From Editorials and Comments, *Journal of the American Medical Association* **157**:243 (Jan. 15) 1955.

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ACETATE CROWN FORMS

in Impression Taking and Casting of Gold and Veneer Crowns

Nicholas C. Demas, D.D.S., D.M.D., New York

DIGEST

Acetate crown forms which are seamless, uniformly thin and strong, and come in a complete range of anatomic shapes and sizes for every tooth in the mouth, have now been developed. This article describes in detail an improved technique for direct impression taking and casting of full cast gold crowns and gold veneer crowns using cellulose acetate crown forms.

Procedure

The initial steps in the procedure are the following:

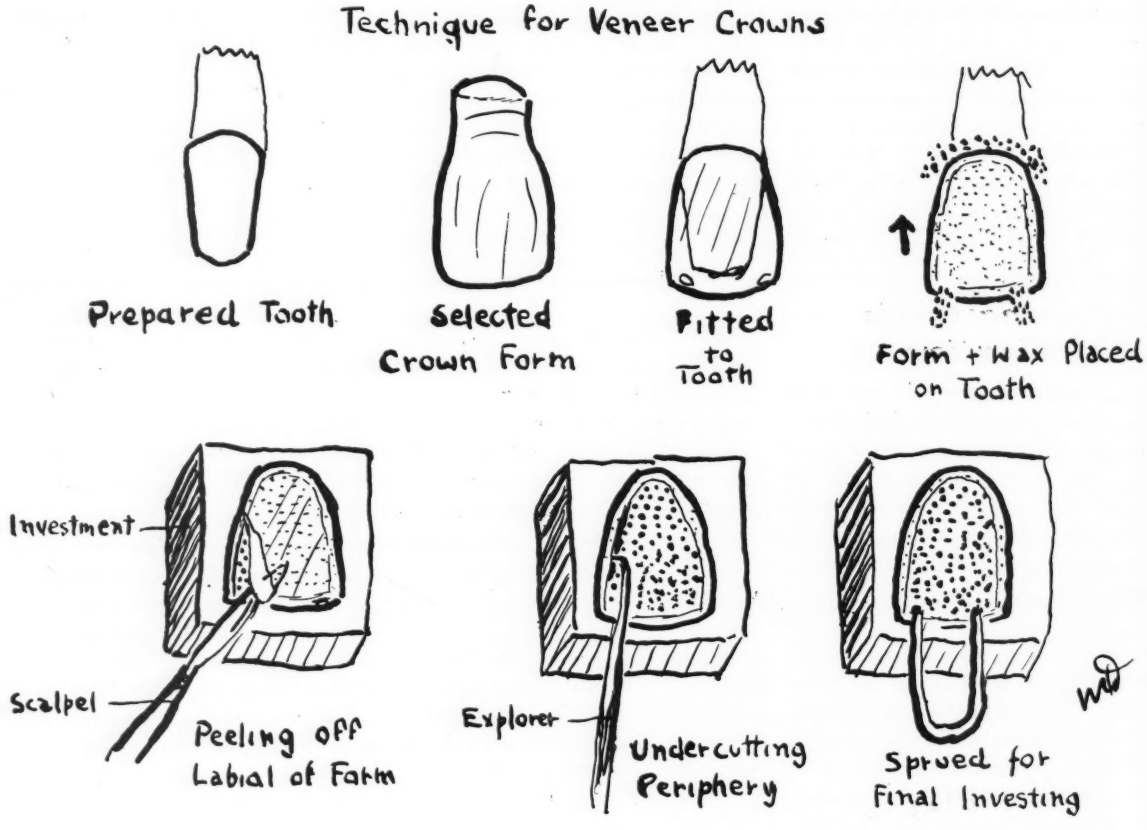
After a tooth (anterior or posterior) is prepared for a crown, a crown form is selected that most accurately resembles the original shape and size of the tooth. Trim the form and fit it directly on the tooth. The acetate form is transparent and permits a remarkable degree of accuracy. This is especially true of the gingival contour which should go well under the free margin of the gum without impingement. At this time check the occlusion by having the patient close with the form in position.

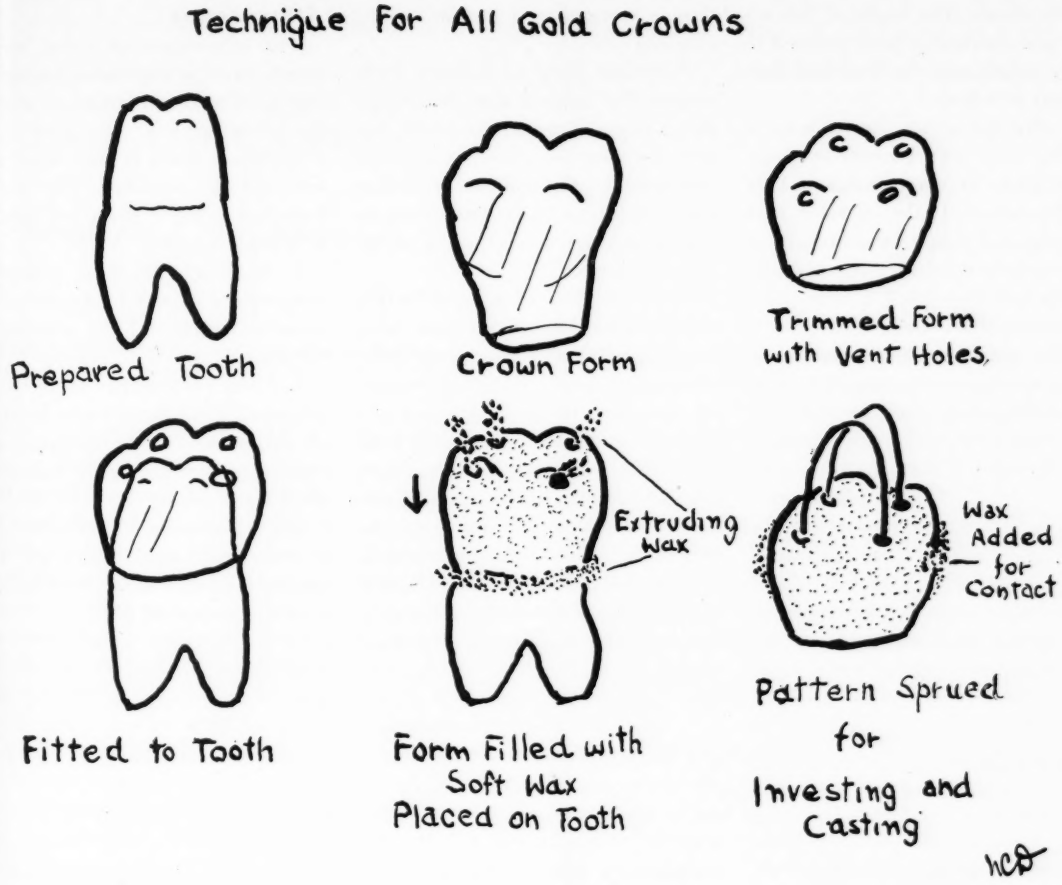
Direct Impression Taken — The trimmed crown is now ready to use in taking the direct impression with inlay wax:

1. Compressed air is used to dry the form thoroughly.

2. Inlay wax is softened over a flame and dripped into the form. Cover the entire inner surface and leave the center hollow.

3. While the wax is still soft the form is carefully centered on the tooth




Technique For All Gold Crowns
Prepared Tooth
Crown Form
Trimmed Form with Vent Holes
Fitted to Tooth
Extruding Wax
Form Filled with Soft Wax Placed on Tooth
Wax Added for Contact
Pattern Sprued for Investing and Casting

and the patient is asked to close softly on the form to seat it. The excess wax is extruded from the open end of the form or through small vent holes that may be previously put through its occlusal surface.

4. If the impression does not go into position (1) the wax has cooled too much, or (2) there is too much wax in the form. This can easily be corrected by softening the wax with a hot spatula thrust into the center of the mass or by scooping out excess wax with a spoon excavator.

5. On inspection of the impression, if it appears that not enough wax is in the crown form, the internal surface can be dried and more softened wax added for another impression.

6. The form is replaced on the tooth and the patient closes in occlusion. This forces the still soft wax into final accurate seating and ensures a correct bite. Any corrections on the outside of the crown can now be made.

7. Wax can be added to the dried form to correct contacts or general occlusion or anatomy. The wax will adhere to the acetate form as though it were entirely made of wax.

8. Excess wax that was extruded through the "vents" or over the gingiva can easily be trimmed away.

9. If less bulk is desired in the final product, wax may be scooped out from the inside of the crown form with a spoon excavator, carefully avoiding the gingival margin.

Investing and Casting—If the casting is to be an all gold crown, it is now ready for investing and casting. Four sprues attached to the cusps with a little sticky wax are recommended for molars and two sprues for bicuspids. For anterior teeth two sprues are used, one at each incisal-proximal corner. U-shaped double sprues made from an ordinary paper clip will serve this purpose.

Impression Technique in Veneer Crowns

For veneer crowns, the impression taking is exactly the same as for all gold crowns, except for one additional step. Before the final pattern is removed, the labial limits of the veneer are marked on the labial surface of the form. This is done by scratching a line on the labial surface of the hard acetate form with the point of a sharp explorer or scalpel.

Veneer Crown Invested—The acetate form is removed and invested in the following manner:

1. Paint and fill the internal surface of the pattern with inlay investment material.

2. Place the pattern into a mass of the original mix, lingual surface down, so that the pattern is completely covered except for the labial surface.

3. Allow the mix to set.

Preparation for Inset—When the investment has set thoroughly and can be handled, the labial surface, which is exposed, can be prepared for the veneer inset:

1. A sharp scalpel is used to cut out the entire labial surface of the hard

acetate crown. The limits of this veneer had previously been outlined in in the mouth and the scratched lines are easy to follow.

2. After the acetate surface is lifted off, the inlay wax beneath is gently pared away to allow sufficient bulk for the veneer. If the operator goes too deep and exposes the investment material below the wax, it can easily be repaired by adding a little more wax to the spot.

3. To provide positive retention, undercut with a sharp explorer. This can be done safely since the hard acetate border permits liberties that could never be taken if the pattern were all wax.

4. The pattern is now ready for investing. A double sprue is attached to the incisal edge with sticky wax and the entire mass is soaked in water. The exposed labial surface is painted with investment material and the pattern is invested in a regular casting ring and cast.

Procedure Used in Indirect Technique—The method described is for direct impressions in the mouth. Exactly the same procedure, however, as that used in the indirect technique can be followed in the laboratory on copper or silver amalgam dies of the prepared teeth.

Accuracy Obtained in Final Casting—Experience has shown that inlay wax and cellulose acetate forms make an excellent combination (1) because the wax sticks to the acetate, and (2) because in the casting process both eliminate completely without any residue. The solidity of the crown form gives a strength which is necessary in taking impressions without distortion, and the softened wax can be forced into all areas of the tooth preparation for complete accuracy in the final casting.

Advantages

The advantages of using acetate crown forms in impression taking and casting of gold and veneer crowns are the following:

1. Speed. There is little or no tedious carving necessary. The acetate form best suited in shape and size can be quickly selected.

2. Accuracy. There is controlled compression of wax in the direct impression because of the stability of the crown form.

3. Fewer accidents. There is no danger of a delicate margin breaking off during handling or readapting and correcting as might be the case in an all wax crown pattern.

4. Easy finishing. The smoothness of the acetate form makes the final casting extremely easy to polish with a minimum loss of gold.

271 *West 27th Street*

Fluorine

Richard H. Follis, Jr., M.D.

Specific Considerations

The indispensability of fluorine for the animal organism has not been as yet completely proved; however, there is suggestive evidence that this element is necessary to protect the integrity of growing teeth. The first positive report dealing with a diet deficient in fluorine and its effect on tooth structure of the rat was made in 1944.

Biochemical Relationships — The biologic role of fluoride ions, whether in increased or decreased concentrations, is not entirely clear. Relatively small amounts of fluoride compounds are tissue poisons doubtless as a result of the inactivation of specific enzyme systems; for instance small concentrations of fluoride ions inhibit the calcification of rachitic cartilage in vitro; on the other hand, similar concentrations have much less action on bone phosphatase activity. The effect of inadequate amounts of fluorine in biochemical reactions has not been studied sufficiently to determine what, if any, the result might be.

Pathologic Effects—Only a few attempts have been made to produce fluorine deficiency in experimental animals. Some years ago three generations of rats were fed a diet low in fluorine content; no effects were noted. Similar animals were fed a milk diet for five generations and only a decrease in the fluoride content of the skeleton was found. More recently hydroponics technique has been utilized to prepare fluorine-free foodstuffs and effects of such a diet on several rats was studied. One animal died in 48 days of starvation because severe caries prevented chewing, while a second rat lived a little longer but severe caries was evident at autopsy. Similar changes have been observed in rats from mothers placed on low-fluorine rations. Histologic studies of such teeth have not been as yet reported and these few animals then furnish the only evidence that fluorine-deficient diets have any effect on the tooth structures of the growing animal.

Fluorine Deficiency in Man—The relationship of fluorine to tooth lesions in the human being has been based more on the effects of increased amounts of fluoride in the diet rather than on decreased concentrations. In 1931, it was conclusively shown that changes in the enamel of the teeth may be found when there is an increased concentration of fluoride in the diet.

Nature of Lesions: Such lesions, mottled enamel or enamel hypoplasia, consist of pits and depressions in the enamel covering of the teeth.

Disease Related to Fluoride Content of Water: Since 1931, numerous epidemiological studies have shown conclusively that this disease is related to the fluoride content of water and, as the concentrations of fluoride increase, the severity of mottled enamel likewise becomes more severe.

Prevalence of Disease in United States: The disease is particularly prominent in this country, especially in New Mexico and certain parts of Texas, where the fluoride content of

(*Continued on page* 358)

UPPER IMPLANTS—

A Modified Technique

Walter O. Goncalves, C.D., and Walter Kanitz, C.D., Rio de Janeiro, Brazil

DIGEST

The authors of this article note that up to the present time in the surgical procedure in the upper implant technique extreme care is used to avoid severing the nasopalatine artery and nerves. This measure is in accordance with the accepted basic principles of oral plastic surgery. Employing the technique advocated by Goldberg and Gershkoff,[1,2] and similar to that described by Lew[3] the authors have performed successfully a number of denture implant procedures. This article presents in detail a modification of that technique in which the nasopalatine artery and nerves were severed without ill results.

Problem in Technique

In the various cases of denture implants completed, postoperative recovery was excellent and healing took place rapidly. It was observed, however, that mechanically the superstructure was not completely stable, especially when the anterior teeth were brought into function, unless the area of support of the denture was considerably increased in the anterior palatine region.

Implant Mesh Extended—In an attempt to solve the problem of anterior instability the conclusion was reached that were the mesh of the implant extended at the incisal region almost to, but falling short of the alveolar ridge, (1) the problem of the stability of the superstructure would be solved, (2) the retention of the implant would be increased, and (3) there would be less bone resorption because the area of bone support used is greater and the osseous structure much denser in this region. The question of the actual disadvantage of severing the nasopalatine artery and nerves arose.

Nasopalatine Artery Severed—This artery had been severed previously when dissecting a cyst of the palate without any immediate or ultimate inconvenience. Victor Veau[4] states that he and his assistant followed the path of these vessels and arrived at the conclusion that these vessels and nerves become so decreased in size in the adult that they lose their functional importance. On the basis of these observations it was decided to adopt a procedure which would provide the desired results.

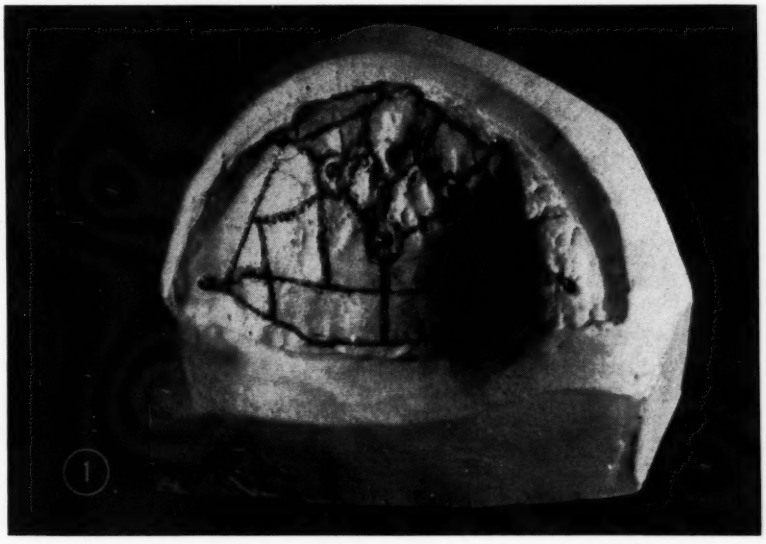
Case History

A woman 45 years of age presented with a conventional denture, mechanically perfect, to which she had not been able to adapt, mainly for psychologic reasons. An implant denture was suggested which would eliminate the unsatisfactory features of the removable denture. The suggestion was accepted.

Procedure—After the preliminary procedures and examinations were completed, the first operation was performed. The following steps were taken:

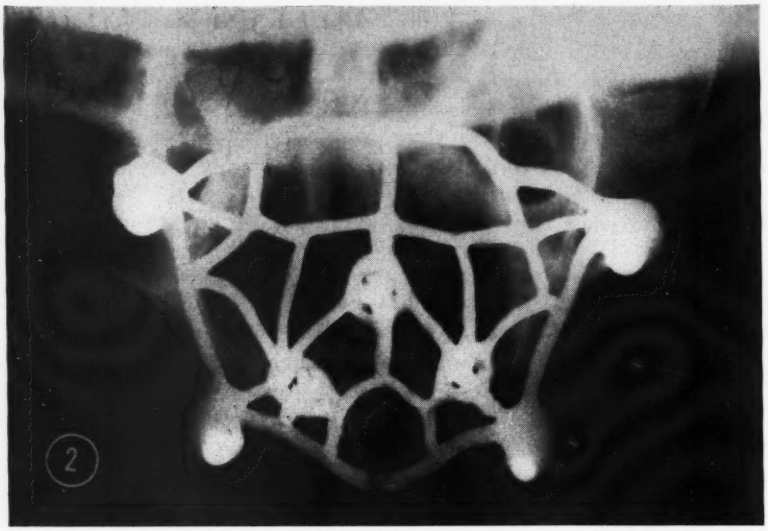
1. Under infiltration anesthesia an incision was made along the crest of the alveolar ridge from the second molar region on one side to the second molar region of the opposite side.

[1]Veau, Victor: Division Palatine, Paris, Masson & Co., 1931, p. 74.



1. ***Shows the design of the implant.***

[1]Goldberg, Norman I., Gershkoff, Aaron: The Implant Lower Denture, DENTAL DIGEST **55**:490 (Nov.) 1949.
[2]Ibid., Further Report on the Lower Implant Denture, DENTAL DIGEST **56**:478 (Nov.) 1950.
[3]Lew, Isaih: Implant Denture—A Simplified Upper Technique Using Immediate Prosthesis, DENTAL DIGEST **58**:10 (Jan.) 1952.



2. ***X-ray view taken one year and a half later. The three screws used are shown.***

2. The mucoperiosteum of the entire palate up to the limit of the incision was reflected with ease. The nasopalatine nerve and vessels were severed. No serious hemorrhage took place.

3. Because of this measure the flap was reflected without difficulty, impression taking was much easier, and suturing was also facilitated.

4. Healing took place normally, no postoperative pain was felt, and the patient did not complain of any numbness or lack of sensitivity.

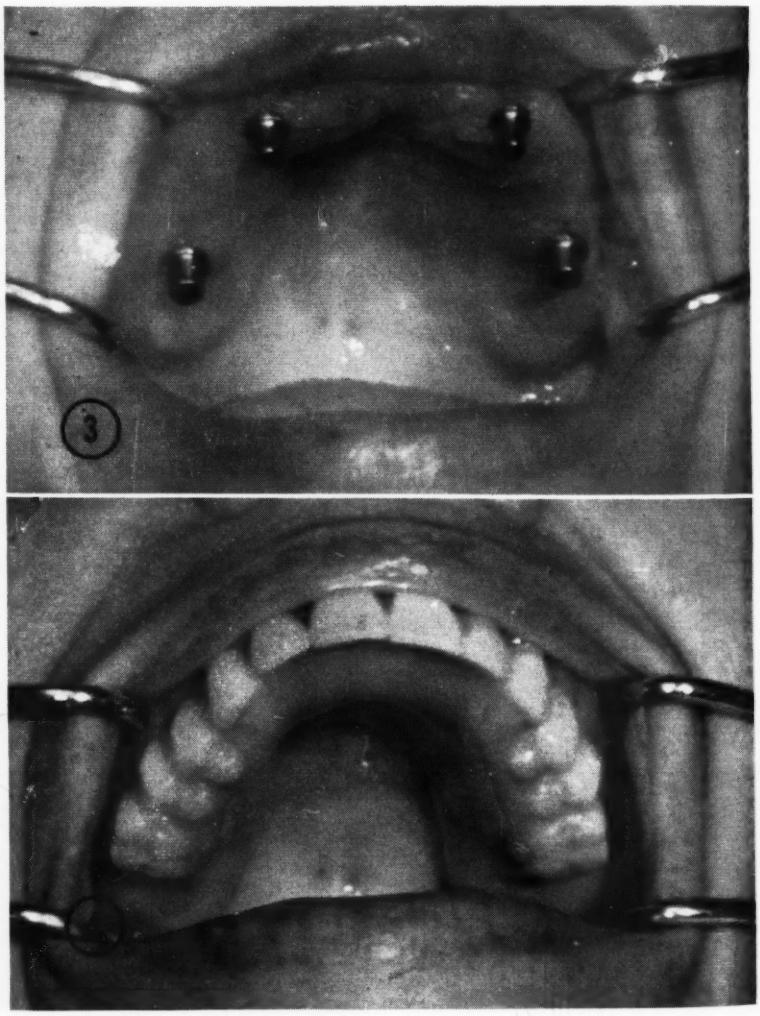
Impression Illustrated—Figure 1 shows the cast of the case, the design of the implant, its extension, and the importance of not placing the connecting bar over the alveolar crest as this encourages adherence of the flap to the bone at the incisal level. The region of the anterior palatine foramen was also left free thereby permitting a possible regeneration of the sectioned nerve.

Second Operation—Approximately three weeks later the second operation was performed under infiltration anesthesia and following the original line of incision. The mucoperiosteum was reflected as in the first operation with maximum ease and no complications.

Implant Inserted—Three screws were used in the implantation procedure: one in the median line one centimeter short of the anterior palatine foramen where the bone is dense and thick, thus avoiding possible communication with the nasal cavity, and two laterals, one on either side, avoiding the maxillary sinuses as shown in Figure 2.

Final Steps—The flap was sutured with single interrupted sutures and after sedatives and antibiotics were prescribed, the patient was dismissed. Postoperative condition was excellent. Healing took place by first intention and seven days after surgery the sutures were removed. One week later the denture was inserted (Figs. 3 and 4).

Slight Decrease in Sensitivity—The patient was entirely satisfied with the procedure and noted nothing abnormal. Testing the mucosa some time later, only a slight decrease of sensi-



3 *and* **4.** ***The implant and denture inserted.***

tivity was noted. The mucosa has since become almost completely normal to sensory stimuli.

Combination of Techniques

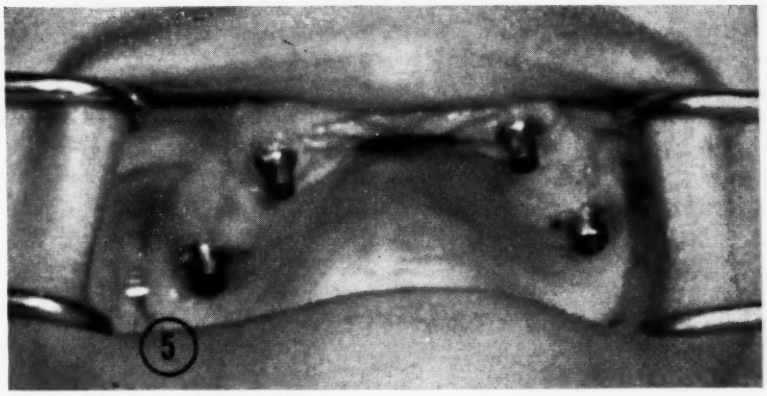
Since completing the case described subsequent implants have been done in the same manner. The implants are firmer and the dentures are completely stable. In the case shown in Figure 5 the incision for the impression taking and the design of the implant were performed according to the former technique but the second operation followed the technique described in this article. The procedure was found easier to perform and had the added advantage of obtaining a free area from the edge of the mesh to the border of incision which allowed the edge of the flap to rest on bone thereby permitting rapid adherence to the bone of the mucoperiosteum.

Implant with One Screw—An implant completed using the technique described but with only one screw can be seen in Figures 6 and 7. The following advantages will be noted:

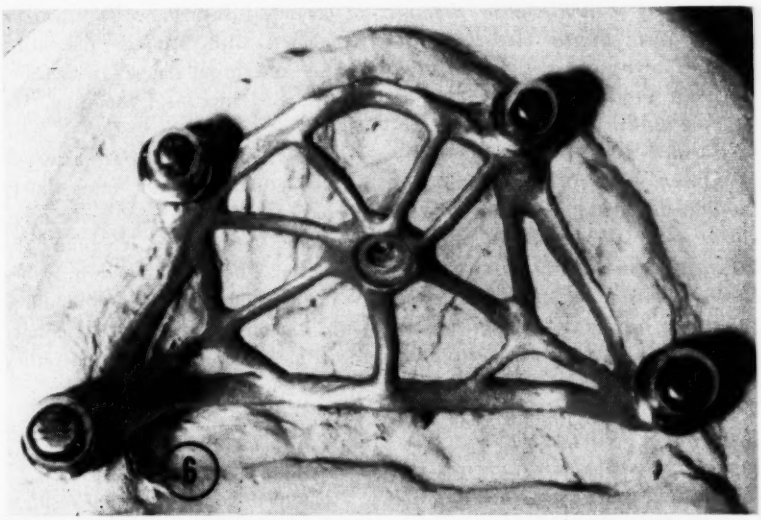
1. The extension of the implant and the importance of not placing the connecting bar over the alveolar ridge, allowing rapid healing and adherence of the flap to the bone tissue along the line of incision thereby avoiding exposure of the implant.

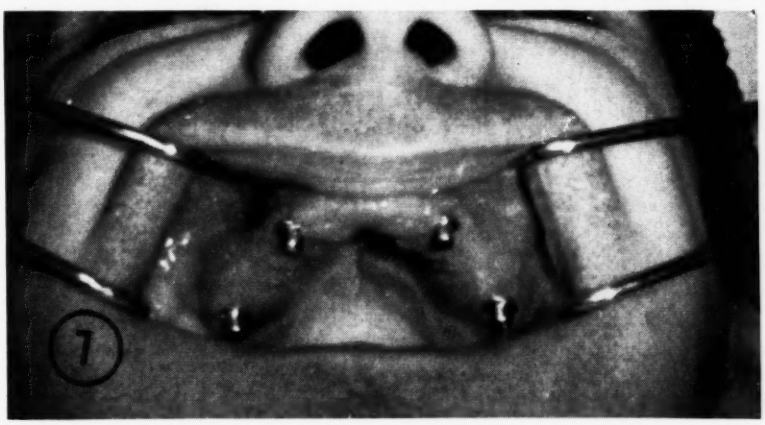
2. A free area is provided around the incisive foramen which permits an eventual possible regeneration of the sectional nerve.

Results Satisfactory—Nine cases of implants have been performed following the technique described. The results have been so encouraging and so much more satisfactory than in the numerous cases performed by the former technique in the last three years that continued use of the technique presented would seem to be justified.



5. ***The incision for the impression and the design of the implant were performed according to the original technique, but the second operation followed the technique described here.***





6 ***and*** **7.** ***An implant performed according to the modified technique but using only one screw. Observe the extension of the implant.***

Summary of Advantages

1. Sectioning the nasopalatine nerve and arteries causes no inconvenience.

2. With this measure the implant has better osseous support; because it covers a larger area, better retention is obtained.

3. The denture is more stable, and stresses are better distributed.

4. Surgical intervention is facilitated; impression taking is simplified because the operative area is more accessible.

Rau da Assemblia 104, 9° *sala* 905.

LARYNGOSPASM *and* RESUSCITATION

in Dental Anesthesia

James LeRoy Vize, D.D.S., St. Louis

DIGEST

The occurrence of laryngospasm in anesthesia is at present the subject of considerable discussion among dental anesthesiologists. Laryngospasm is defined in most medical dictionaries as "a spasmodic closure of the larynx" and is a condition to be reckoned with in dental general anesthesia. Interpretation of the signs and symptoms of a true laryngospasm differs among anesthetists. The symptoms may vary from an ordinary gurgling or coughing reflex to a spastic condition of the laryngeal structures. This article describes in detail procedures for correcting this protective reflex and emphasizes in particular the possible advantage to be gained from this occurrence.

Causes of Laryngospasm

The following are some of the common causes of laryngospasm:

1. Irritation or overstimulation of the soft tissues in the pharynx, the vocal cords, larynx and trachea, sometimes resulting in interference or cessation of respiration.

2. It may also be caused by the oral-pharyngeal partition being pushed too far back in the mouth or throat or by the accumulation of fluids in these areas. The condition usually manifests itself in the early or induction stage; spasm may occur, however, at any time during anesthesia.

3. The mouth barricade, fluids, or foreign bodies may interfere with the available oxygen intake, thereby reducing oxygen consumption below the minimal physiologic requirements.

Symptoms—The approaching signs of laryngeal disturbances are usually associated with peculiar phonating sounds and throat reflexes, sometimes resembling hiccups, coughing, or gurgling.

Immediate Correction Necessary—If the situation is not immediately corrected, the signs may become accentuated, respiration irregular, the patient may become flushed or cyanotic with dilated pupils accompanied with various degrees of spasticity sometimes succeeded by respiratory arrest.

Method to Correct Condition

All impediments to normal respiration must be instantly removed and pure oxygen administered. This is done in the following manner:

1. Remove prop, gauze, or cotton barricade; aspirate the fluids or aid the patient to cough up these fluids by tilting his head forward.

2. At the same time the chin is brought up, the nasal inhaler is replaced by a face mask which is applied tightly over the mouth and nose so that no oxygen escapes.

3. While holding the exhaling valve closed, exert a steady, gradually increasing pressure on the emergency direct oxygen button of the gas machine and observe carefully to see that the chest expands. This is evidence of oxygen entering the lungs.

4. After approximately three to six seconds when the chest expands, lift the inhaler or face mask off the face to allow exhalation from the elastic recoil of the lung tissues. Inexperienced operators are inclined to hold the inhaler on the face too long, thus interfering with deflation or exhalation. Repeat the corrective steps, if necessary.

Problems in Resuscitation

The laryngospasm experience is critical and successful resuscitation depends upon applying proper measures at the proper time. To become excited increases the patient's danger should the following conditions be present:

1. Gas lines may become fouled.

2. Nasal inhaler or face mask may not be well adapted or may even become disconnected.

3. The exhaling valve may not be forcibly held down, or closed to prevent oxygen escape.

4. Oxygen pressure may not be sufficient or maintained long enough to force it into the lungs.

5. In exchanging the nasal inhaler for the face mask, time-wasting slip-ups may occur.

6. If the patient is out of position, which is frequently the case, with head too far forward and chin on chest, or with head and neck bent too far back with the chin depressed, efficient resuscitation is impossible to perform. All these situations can occur in dental anesthesia if a calm, planned method of procedure is not followed.

Application of Oxygen—It is difficult to inflate the lungs of adults with oxygen after respiratory arrest. The essential requisite for this measure is adequate oxygen pressure; many fatalities can be attributed to lack of pressure.

Pressure Administered — When laryngospasms reach the respiratory

arrest stage in robust adults, there should be no hesitancy in using all the pressure a gas machine is capable of delivering. Clement[1] states, "The pressure under which the oxygen is delivered by the direct oxygen valve is never sufficient to cause damage to the lung tissues of adults."

Oxygen Pressure Cumulative—The maximum dial pressure on most gas machines does not exceed 40 millimeters Hg. If pressure is maintained, however, on the emergency oxygen button or lever with the face mask held tightly over the mouth and nose, this pressure is cumulative and builds up to approximately 60 or 70 millimeters and will blow out from the sides of the face mask or inhaler no matter how tightly the inhalers are held.

Normal Lung Pressure not Exceeded—The average adult can exert about 80 millimeters pressure on the lung structures by forcible exhalation, as in blowing up a rubber balloon; it would therefore seem logical to conclude that lower pressure on normal adults would not result in lung damage. These pressures should of course be considerably less for children and debilitated persons.

Insufflation Resuscitation

Experienced anesthetists and oral surgeons can change from inhalation anesthesia to insufflation resuscitation in five to ten seconds. If respiration has stopped, insufflation resuscitation should be resorted to because (1) the patient is incapable of inhaling, (2) the respiratory function has been lost, and (3) oxygen must be forced into the lungs under pressure.

Resumption of Breathing not Immediate—Apnea persists until the blood carbon dioxide has accumulated sufficiently to stimulate the respiratory center. A weak inspiratory gasp is frequently succeeded by quiet and shallow respiration which gradually increases to a more normal rate and depth.

Resumption of Breathing may be Delayed—Clement[2] states, "Continuous vigorous inflation of the lungs with oxygen merely delays further the resumption of spontaneous breathing, due to the 'washing out' of the carbon dioxide and the saturation of the blood with oxygen. Normally, inflation of the lungs once or twice is sufficient."

Operative Skill Required—If these so-called laryngospasms are observed in the early stage and the patient is still capable of inhaling, indicating airways open or partly open, the inhalation resuscitation method can be used. When there is doubt of the patient's ability to inhale, however, the insufflation method is advised. Knowing when and how to use each of these methods of applying oxygen instantaneously to a patient when valuable seconds are ticking off is of vital importance. To use the inhalation method when insufflation is indicated in inexcusable.

Contributing Factors in Resuscitative Methods

Time is an important factor in correcting respiratory arrest. The heart usually continues to beat from one to two minutes; to waste this valuable time in resorting to other dubious methods of resuscitation may be fatal. It is logical to conclude that interference with or lack of oxygen intake caused the respiratory crisis and restoration of oxygen equilibrium is the proper corrective measure.

Drugs Secondary to Oxygen Inflation—Clement[3] states, "Should respiration cease, do not waste time with other methods or procedures, but immediately force oxygen into the lungs." He adds that the value of drugs is secondary to inflation with oxygen.

Aspiration of Foreign Material Prevented—The patient should not be allowed to become conscious of the situation. By decreasing anesthesia the cough reflex becomes more active in helping the patient to prevent aspirating vomitus or fluids. To attempt insufflation and inhalation resuscitation without open airways, with vomitus, fluids, and other obstructions present in the mouth, throat, and nose increases danger by forcing or blowing foreign material into the trachea before the cough reflex can take place effectively. Cough reflexes are useful in helping to clear up such situations. The use of the suction pump to aspirate fluids is also an indispensable asset.

Laryngospasm May be Useful—An experienced anesthetist will realize that although these protective signs are not particularly desirable they can be used to good advantage to return the patient into surgical anesthesia. A majority of so-called laryngospasms in dental anesthesia are the result of fluids and they frequently continue until there are no more fluids. By administering more oxygen and lightening anesthesia, therefore, the regurgitation of fluids is encouraged so that they may be aspirated or removed. This serves to dehydrate the patient to a considerable degree making continued induction and maintenance easier. As these reflexive disturbances occur frequently, rather than fearing them they might be considered an advantage: their occurrence indicates that the patient is unconsciously trying to correct an abnormal condition. The anesthetist is warned that aspiration and correction are indicated.

True Laryngospasm in Dental Inhalation Anesthesia—Clement[4] states, "True laryngospasm, such as develops with cyclopropane and pentothal sodium, never occurs with nitrous oxide and oxygen. Spasm of the vocal cords, with or without phonation or stridor, may occur in deep anesthesia but the condition is immediately relieved with the administration of oxygen." This statement presents the question: does true laryngospasm actually occur in dental inhalation anesthesias?

Synergistic Agent Possible Cause—The signs and symptoms of these protective reflexes under most inhalation anesthetic agents so closely resemble each other that it is difficult to arrive at a fine line of demarcation between ordinary reflexes and true spasticity. Being milder in character and more easily corrected, it would seem that true laryngospasms do not occur with nitrous oxide-oxygen anesthesia, and

[1]Clement, F. W.: Nitrous Oxide-Oxygen Anesthesia, ed. 2, Philadelphia, Lea & Febiger, 1945, p. 159.
[2]Ibid.: p. 157.
[3]Ibid.: p. 341.
[4]Ibid.: p. 146.

when they do occur it may be due to the synergistic agent used.

Episodes not Serious — Fierstein[5] states, "Laryngospasms in inhalation anesthesia are not serious, and as a rule they can be taken care of in a few seconds, provided you discover them early."

Fear Overstressed—The fact that a patient while under any inhalation anesthetic may have some of the signs and symptoms mentioned would not necessarily mean that he had a laryngospasm. Conscious persons have phonation, coughing, retching, and gurgling reflexes from fluids and other irritating factors. The same protective reflexes usually correct the condition. For instance, while drinking water a small amount may be drawn into the trachea. Muscular reflexes immediately cause gurgling, and retching. This condition is not a true laryngospasm. It is however, frequently encountered.

[5]Fierstein, M.: Transcript of the October 25, 1954 meeting of the American Society for the Advancement of General Anesthesia in Dentistry, p. 14.

Conclusion

When the dental anesthetist and oral surgeon learn to recognize and utilize the protective reflexes to advantage in maintaining anesthesia for long or short periods (five minutes to an hour or more) one of the main obstacles to the administration of a safe inhalation anesthesia in the dental office will be surmounted.

3608 *South Grand Avenue*

Fluorine (*Continued from page* 352)

the water may be very high. For instance, in Lubbock, Texas, the water contains 4.4 parts of fluorine per million, and, as a result, over 90 percent of the children between the ages of 9 and 11, have mottled enamel.

Results of Histologic Examination —As would be expected from the gross appearance, histological examination of such teeth reveals the ameloblasts to be most affected; such cells apparently become inactive and assume a flat shape. In addition, defects in calcification of the dentine appear and this material becomes stratified. There is also damage to the odontoblasts since many have pyknotic nuclei. Though only the teeth of the growing organism are affected, bone may be involved in hyperfluorosis at any age; such osseous changes consist of thickening of the trabeculae in the shaft and the periosteal new bone formation about the cortex. In the human being the concentrations of fluoride in the drinking water necessary to produce these changes must be relatively large and a fairly long period of ingestion of such concentrations must prevail before radiologic and histologic defects can be found in the bones.

Relation of Fluorine Metabolism to Preventive Medicine

An even more important phase of fluorine metabolism in its relation to preventive medicine is the accumulating evidence that certain concentrations of fluoride compounds in drinking water protect against the development of dental caries. Several years ago because the water supply in Bauxite, Arkansas, contained a high content of fluorine the source of the water was changed to one which contains virtually none of this element. When, about 10 years after this change, the teeth of the children in Bauxite were examined, the incidence of mottled enamel was found to be as high as expected; more interesting, however, was the observation that such children who had been drinking this fluorine-free water for 10 years had an extremely low incidence of dental caries. In contrast, children living in a nearby town who had used the same source of fluorine-free water all their lives had a high incidence of caries.

Prevention of Dental Caries—These and other observations have stimulated a tremendous amount of interest in the use of fluorine to protect against dental caries; at the present time extensive research programs dealing with this problem are under way in a number of states.

Impressive Data Presented—The most impressive data which are available on caries prevention have been furnished by Knutson of the Public Health Service.

1. In April and May of 1942 a group of children received seven to 15 topical applications of sodium fluoride solution to the teeth in the left upper and lower quadrants of the mouth.

2. Upon examination two years later 41.3 per cent less teeth were carious on the treated than in the untreated side of the mouth.

3. In addition, the number of additional carious lesions in teeth which were decayed at the beginning of the study was 23.1 per cent less in the treated than in the untreated carious teeth.

The results of similar studies now being carried on will be awaited with interest.

Adapted from *The Pathology of Nutritional Disease* by Richard H. Follis, Jr., M.D., Springfield, Illinois, Charles C Thomas, 1954, p. 68.

The EDITOR'S Page

ALTHOUGH the dentist carries on his work in close proximity to the salivary glands he usually gives but passing attention to these important structures. The chemistry of the saliva is of importance in the incidence of caries. The chemistry of the saliva in turn is related to the blood from which saliva is formed and to the health of the glands that create this important body fluid. Saliva is a lubricant, a digestant, a buffering protective agent.

It has been shown by Kirkwood[1] that the iodide ion is secreted in the saliva to maintain the consistency of the secretions of the biochemicals from the *thyroid* gland. According to this hypothesis it is conceivable therefore that the iodide ion as well as the fluoride ion is an anticariogenic agent. In case of hyperthyroidism there is more iodide to be recycled through the salivary glands, there is more saliva secreted, and it has been observed that there are fewer lesions of caries. The opposite would hold in hypothyroidism: less iodine, less saliva, more caries.

The salivary glands are subject to inflammation, infection, and blockage from calcific deposits. None of these conditions is ordinarily endangering to life. The salivary glands, however, are also subject to malignant disease and this is definitely a threat to survival. The dentist should be alert to observe swellings of the face, under the jaw or chin, or in the floor of the mouth. All such swellings are not the evidence of malignant disease. Many local inflammatory or infection factors can produce such swellings, and fortunately most swellings are produced by nonmalignant mechanisms.

In making an evaluation of swellings within the mouth or within the contiguous tissues the dentist should never forget that what would appear to be a transitory inflammatory reaction may be a malignant lesion.

A primer on malignant disease of the salivary glands as adapted from the *Cancer Bulletin*[2] would read:

1. Salivary gland tumors are among the most variable of all the tumors. They may be benign, malignant, or mixed.

2. Tumors occur most often in the parotids (87.3 per cent), less often in the submaxillary glands (12.2 per cent), and infrequently in the sublinguals (0.5 per cent).

3. The first symptom is unilateral swelling and if the mass is freely movable, of long duration, and is not attached to the skin, it is likely to be benign (63 per cent).

4. The problem of diagnosis of enlargements in the submaxillary glands is more complex. The relative rarity of these tumors, the frequent complication of calculi in the submaxillary ducts, and the incidence of inflammatory and metastatic lymph nodes are all factors that obscure exact identification of lesions in the range of the submaxillary glands.

5. Tumors in the sublingual gland are rare and must be distinguished from cancers originating in the floor of the mouth.

6. Treatment: the majority of salivary gland tumors are not radiosensitive; hence, the only effective method of treatment is surgical removal. Since these neoplasms are always progressive and likely to undergo malignant change, treatment should not be delayed. Paralysis of the facial nerve will eventually occur from untreated tumors.

7. There is a strong tendency among dentists and physicians to temporize and delay treatment hoping that a swelling or inflammation will subside following antibiotic treatment or the removal of diseased teeth or tonsils.

In the same issue of the *Cancer Bulletin* a warning is quoted from Durham:[3]

"Valuable time may be lost while treating patients with malignant disease masked by the miracle drugs. He enjoins physicians [and the same applies to dentists] to remain aware that neoplastic processes can simulate inflammation. Hence a high level of suspicion of cancer should be maintained. This will allow more accurate diagnostic procedure to be performed early and prevent non-specific antibiotic therapy to obscure the real nature of the disease."

[1]Kirkwood, S., and Ryan, E. J.: Explanation of the Effect of Feeding Desiccated Thyroid on the Incidence of Dental Caries in the Rat, *Science* **121**:175-176 (February 4) 1955.
[2]Tumors of the Major Salivary Glands, Cancer Bulletin **7**:35 (March-April) 1955.
[3]Durham, Milton W.: Cancer Bulletin **7**:42 (March-April) 1955.

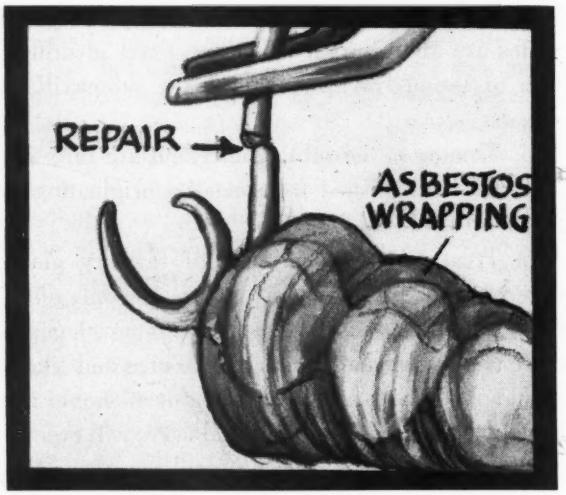
1

Clinical and Laborator

Modeling Compound Impressions

Harry M. Smallen, D.D.S., Brooklyn, New York

1. When using modeling compound for an impression, line the metal tray with tin or aluminum foil. This prevents the compound sticking to the impression tray.

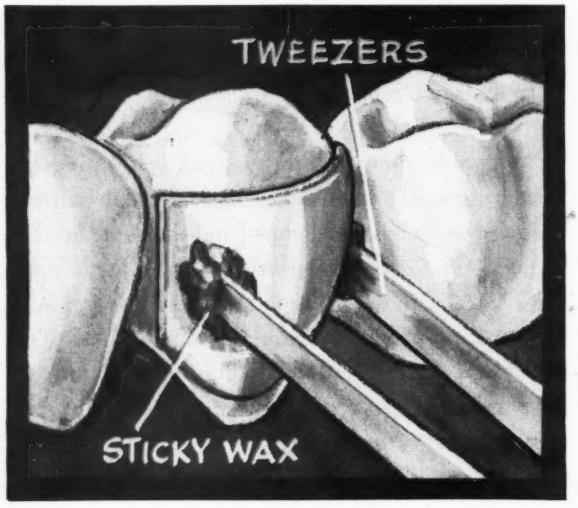


2

Partial Denture Repair

Charles H. Hughes, D.D.S., Garden City, Long Island, New York

2. If some minor repair is required in a gold partial denture, it may be done without the removal of the porcelain teeth. Moisten some asbestos (the type used in the inlay casting ring) and wrap the asbestos tightly around the teeth and the denture saddle. Solder the broken part and allow the case to cool to room temperature.



3

A Well-adapted Cervical Matrix

R. W. Deeney, D.D.S., Perry, New York

3. Stainless steel matrix metal 1 quarter inch wide and .001 gauge is cut slightly wider than the cavity. One edge is cut to the contour of the gingival margin. The metal is curved to fit the contour of the tooth. Two drops of sticky wax are placed on the matrix and the tips of the adjustable tweezers are engaged in the wax. Such a matrix may be used for any type of class V restoration.

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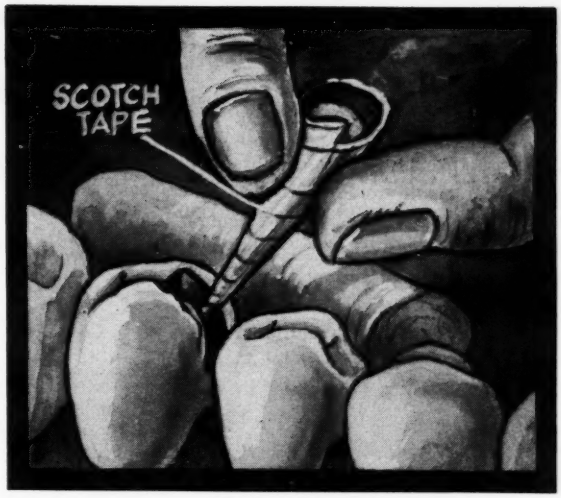
SUGGESTIONS . . .

Individual Alginate Impressions

T. D. Schaad, D.D.S., Kansas City, Missouri

4. Roll a piece of Scotch brand tape around an instrument to make a small cone. Fill the cone with a thin mix of alginate and carry to the cavity preparation. Squeeze the cone to deposit the alginate in the cavity. Fill the impression tray with alginate and place over the individual impression and over the other teeth in the area.

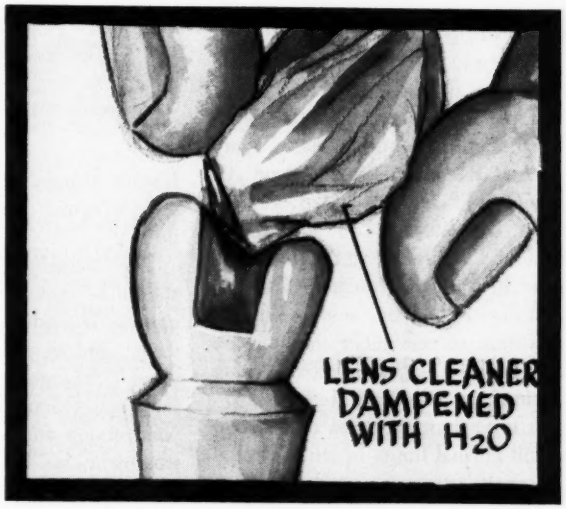


4

Polishing Wax Patterns

Robert M. Garvey, D.D.S., Oklahoma City, Oklahoma

5. After the wax pattern is carved to form on the stone die, polish the pattern with a piece of wet cleaning tissue that is used for eyeglasses.

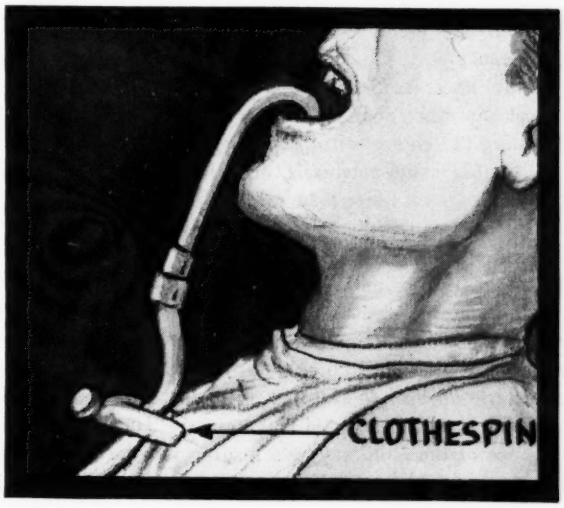


5

A Saliva Ejector Holder

J. Meade Bowman, D.D.S., Knoxville, Tennessee

6. By using an ordinary clothespin the rubber tube from the saliva ejector is fastened to the patient's neck towel in the proper position for maximum comfort and efficiency.

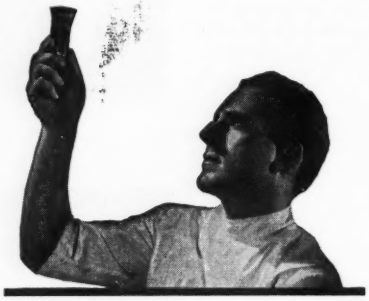


6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 366 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences



Acute Appendicitis

Errors in the diagnosis of acute appendicitis probably exceed those of any other acute abdominal disease with the possible exception of acute pancreatitis. The errors are due to atypical symptoms and physical and laboratory findings.

Usually the attack is initiated by epigastric pain. This is followed by nausea and vomiting and later by localization of the pain in the right lower quadrant of the abdomen. Many patients complain of gaseous distention, with a feeling of distress in the midabdomen such as is experienced after eating some food that is poorly tolerated. A sense of complete cessation of intestinal function is also strongly suggestive of acute appendicitis.

If the appendix lies in the pelvis, diarrhea may be an associated symptom. If the attack is fulminant, the patient will be prostrated immediately. Usually, however, the onset is gradual. The temperature is not elevated in the early hours and the patient does not appear acutely ill. It is important to remember that the leukocyte count is not a reliable diagnostic sign. This count may rise to a high level in some cases and remain within normal limits in others. Palpation elicits tenderness over the site of the appendix. Tenderness in the flank indicates a high-lying retrocecal appendix. Tenderness in the pelvis on digital examination suggests a low position. Rebound tenderness is a significant sign.

Acute appendicitis may resemble almost any other abdominal disorder including (1) cholecystitis, (2) diverticulitis, (3) acute amebiasis, or (4) even a malignant lesion with perforation. However, the diagnosis of such cases should be clarified easily by a thorough history and by roentgen and laboratory studies. A clinical picture almost identical to that of acute appendicitis is presented by mesenteric adenitis in children. This condition may be suspected if the appearance of the child suggests insufficient nourishment and if there is a history of poor appetite, constipation, and irregular attacks of cramping pain.

The acutely inflamed appendix should be removed as soon as the diagnosis is made. Drainage is unnecessary unless perforation has taken place. Strangely, although the patient will ultimately recover after appendectomy and appropriate medical treatment, he may continue to have attacks of pain for some time, and the family should be so advised.

Sanders, R. L.: Acute Abdominal Disease, JAMA **155**:1-4 (*May* 1) 1954.

Dizziness

Vertigo is a common symptom. It requires careful analysis. Vascular disturbances are responsible for much of the vertigo seen in patients. The disorder may be a result of physical change as in arteriosclerosis or as a result of autonomic dysfunction.

The patient with arteriosclerosis may have vertigo, deafness, and tinnitus. Hearing loss is usually bilateral. Tinnitus is of a high-tone nerve type and sounds are not distorted.

Patients with autonomic dysfunction have dizziness with change of position and ringing tinnitus but not deafness. Dizziness lasts from a few minutes to days and is attributed to vasomotor instability. The condition occurs in either sex at any age but is common among women in the forties, most frequently in the allergic patient in an emotional or tension state.

With Meniere's disease, vertigo is explosive and severe, frequently occurring without warning. Attacks may last from a few minutes to hours. Nausea and vomiting are secondary symptoms reflecting the intensity of the vertigo. In the longstanding cases the symptoms disappear as the vertigo loses intensity.

Deafness is usually unilateral and cochlear in type, with a fairly uniform loss in all frequencies. Fluctuation of hearing is an early finding and often precedes dizziness. Distortion of sound is a diagnostic sign. The quality of sound may be altered. The affected ear may be so sensitive to loud noises that the patient wears a cotton ear plug.

Tinnitus is described as a low-pitched roar. It often fluctuates with hearing loss.

Dizziness without hearing loss but sometimes with tinnitus is occasionally caused by (1) toxic labyrinthitis from infection, (2) virus influenza, (3) sudden eustachian tubal block in the middle ear, and (4) mastoid disease. Streptomycin and other similar drugs may cause dizziness and hearing loss and occasionally irreversible damage to the function of the labyrinth.

Jordan, E. Raymond: The Dizzy Patient, Pennsylvania M. J. **57**:125-128 (*February*) 1954.

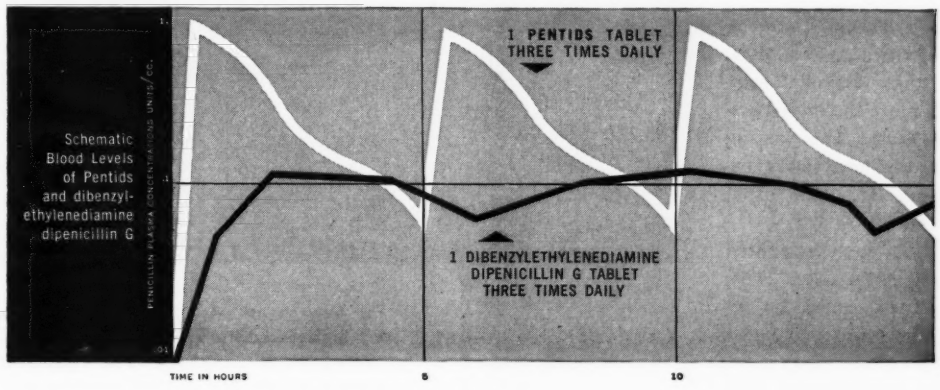
Contact Lenses—Use

About 80 per cent of all contact lenses are worn for cosmetic purposes. Such lenses offer the most practical and, at times, the only solution to the optical problem in cases of

just 1 or 2 Pentids Tablets three times daily

as adjunctive therapy

for the more common dental infections


Schematic Blood Levels of Pentids and dibenzyl-ethylenediamine dipenicillin G
PENICILLIN PLASMA CONCENTRATIONS UNITS/CC.
1 PENTIDS TABLET THREE TIMES DAILY
1 DIBENZYLETHYLENEDIAMINE DIPENICILLIN G TABLET THREE TIMES DAILY
TIME IN HOURS
6
10

Pentids are particularly effective as adjunctive therapy for acute oral Vincent's disease, pericoronitis, alveolitis, dento-alveolar abscess, cellulitis, and osteomyelitis. Also for prophylaxis before and after extraction and other dental surgery.

When pre-existing cardiac lesions predispose to sub-acute bacterial endocarditis or there is extensive tissue trauma, parenteral penicillin should be given before or at time of extraction followed by Pentids postoperatively.

PENTIDS

(Squibb 200,000 Units Penicillin G Potassium)

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Dosage:

1 or 2 Pentids Tablets three times daily ½ hour before meals.

Supply:

Bottles of 12 and 100 tablets.

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Pentids-Soluble Tablets, 200,000 units of soluble penicillin G.

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Dosage:

Contents of 1 or 2 Pentids Capsules three times daily ½ hour before meals.

Pentids Capsules are opened and their soluble penicillin is added to approximately 2 ounces of milk, fruit juice, ginger ale or similar vehicles.

Supply:

Bottles of 24 and 100 capsules.

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irregular astigmatism and monocular aphakia.

There are four types of lenses in current use:

(1) The conventional lens requiring an artificial solution between lens and cornea which is the easiest to fit. Because of the fluid and blocking of atmospheric oxygen from the corneal epithelium, the use of this type is restricted to keratoconus patients, whose irregular corneal surface makes capillary fitting difficult.

(2) Fenestrated lenses. These allow exchange of oxygen and tears. They do not require artificial solutions. These lenses are the most satisfactory for general use. The wearing time is considerably lengthened because the cornea is bathed in usual fluids.

(3) Mueller-Welt lenses are fitted as large and loosely as possible. Thus, cylinders and prisms cannot be incorporated. Molding and prolonged fitting periods are unnecessary.

(4) Corneal lenses which are held in place by capillary approximation to the cornea. These lenses are completely invisible and cosmetically most desirable. Yet 60 per cent of patients cannot wear them because of mechanical or psychologic reasons. Corneal abrasion is also a constant threat.

Prosthetic contacts may be used to improve on the appearance of unsightly and shrunken globes. Individual molding and meticulous fittings are as important as with any contact lens. The front surface of the clear plastic lens is painted to match the other eye. Motility is good and, with proper centering of the iris, appearance is satisfactory.

Before contact lenses are fitted, suitability of the patient must be determined. Individuals with (1) prepresbyopia, (2) frank presbyopia, (3) minor refractive errors, (4) high prismatic prescriptions, or (5) sensitivity to plastic, (3) bullous keratosis, (4) epithelial dystrophy, and (5) active or chronic infection of the lids, conjunctiva or anterior segment also preclude contact lenses.

Keeney, Arthur H., and Duerson, H. Lyle: Contact Lenses: Current Concepts and Local Use, Kentucky M. A. **52**:87-91 (*February*) 1954.

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For new speed and convenience in amalgamating . . . for high early strength, accurate dispensing and smooth carving it's S. S. White's New True Dentalloy. Specially processed into fine uniform particles for easy, non-clogging accurate dispensing. Polishes to a high, lasting lustre. Resists tarnish and oxidation. For truly superior restorations, use New True Dentalloy.

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In addition to 1 and 5 oz. bottles, New True Dentalloy is available in a special combination package including a stainless dipper. Ask your salesman about this—and the unique Alloy and Mercury Dispenser No. 1.

Trigeminal Neuralgia

The diagnosis of trigeminal neuralgia is obvious. Its causes and pathology, however, are still unknown. Sudden electric-like pains in the second or third and, occasionally, the first division of the trigeminal nerve are initiated by any slight stimulus. The patient lives in constant dread of another attack.

Temporary relief is offered by (1) section of the sensory root of the fifth nerve, (2) differential sections of the posterior root, leaving the ophthalmic division intact, (3) division of the descending tract, and (4) alcohol injection of the nerve. Pain and sensation return later. When the posterior root is sectioned anesthesia of that part of the face is noted.

A modification of a common procedure promises to bring permanent relief without producing any lasting

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troublesome side effects. The ganglion is approached by the extradural method. The lateral half of the sheath of the ganglion is exposed, and the dura propria is incised lengthwise with the ganglion to the dural fold at the petrous ridge. Just lateral to the fold, the dura is incised under the temporal lobe for about one quarter inch. After the intradural space and the opening occupied by the posterior root are inspected, the dural fold is divided between hemostats or silver clips. The fibers of the ganglion and the posterior root apparently seldom lie completely free in the dural sheath, and the fibers must be separated from the sheath.

Occasionally, the pain is only partly relieved in the immediate postoperative period but usually disappears completely after a short time. A slight, temporary, spotty sensory loss is noted postoperatively, probably from the trauma of the hemostats on the posterior root or from the crushing or division of roots adherent to the ganglion sheath by the hemostats or by the dural fold section. The adherent fibers do not seem to be trigger fibers. No definite reason can be given for the pain relief achieved by the operation, since compression of the ganglion and root is ordinarily not found. If the pain relief is not complete postoperatively, the nerve can always be sectioned later, and with little risk or surgical trauma.

Cleveland, David, and Kiefer, Edward Jern: Decompression of Ganglion and Posterior Root of Fifth Nerve for Trigeminal Neuralgia, Arch. Otolaryng. **59**:30-35 (*January*) 1954.

Nutrition and Disease

THERE IS increasing evidence that dental caries is in part at least the result of a faulty diet. The disease can be controlled in susceptible persons rigidly omitting fermentable carbohydrates from the diet and giving them nonadherent, rough, coarse foods that clean the teeth by friction. When such persons "break training" their salivary dental caries activity test again becomes positive before any visible signs of dental caries appear.

That studies of human nutrition will continue to bring to the clinician fundamental knowledge about the prevention and treatment of disease cannot be doubted. Greater efforts will be made to find ways of detecting subclinical nutritional deficiencies so that corrective steps may be taken before any disability occurs. Already, important information on a patient's vitamin C status can be obtained from the concentration of ascorbic acid in the plasma. Spies and his co-workers believe that diseases are chemical in origin and that they can be chemically prevented and corrected. They have gone a long way toward proving their contention.

From Editorials and Comments, *Journal of the American Medical Association* **157**:1024 (March 19) 1955.

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prevents RUST in your sterilizer . . .

Simply add Nitrodene to the water in sterilizer for positive protection from the ravages of rust.

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CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 360 *and* 361)

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708 Church Street
Evanston, Illinois

From: _____

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Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

$10 will be paid on publication for each suggestion that is used.

Contra-Angles

Press Agent's Dream

The candy and soft drink people have been feeling the inroads in their business from the nutritionists who are emphasizing the dangers to dental and general health from refined sugars. These powerful interests are not going to accept this falling off in their sales without striking back. As they say in the advertising trade, they have been looking for a gimmick. They appear to have found one.

Some bright press agent for the National Confectioners' Association was inspired to search for a child who has never had a cavity in his teeth and make the child the object of the candy makers' munificence. A poor little six-year-old girl was found and was taken before the big news cameras to be crowned the corny and fantastic title, Aga Khandy of 1955. The poor little innocent dear was then offered her weight in chocolate candy, 45½ pounds of cariogenesis.

It is a clever gimmick and produced the response that was intended: stories and pictures in the newspapers and the appearance of the child on television. The planned psychologic association is clear. The idea to be conveyed is simple: Here is a child who has never had a decayed tooth so now she received 45½ pounds of candy and that can't possibly hurt her—or any other child. It is a subtle and clever piece of promotion.

It is the kind of opposition that we can expect when we step on the toes of the vested interest. Anything for increased sales, even if the products are harmful to health, seems to be the unprinted slogan of the manufacturers of candy and soft drinks. Even their own kids must use the products and suffer from these nutritional assaults.

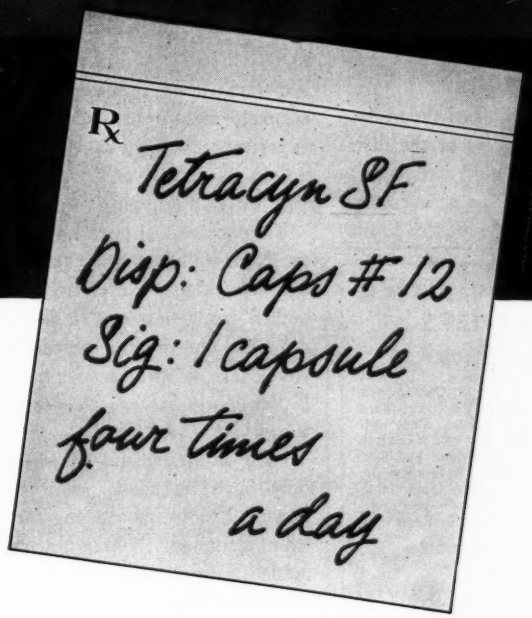
(*Continued on page* 370)

FIGHT INFECTION

Tetracyn® SF*

CAPSULES 250 mg. ORAL SUSPENSION fruit flavored, 125 mg. per 5 cc. teaspoonful

To fight the infection and stress fortify the patient with vitamins, write **SF*** with your prescription for Pfizer tetracycline



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Ascorbic acid, U.S.P.	300 mg.
Thiamine mononitrate	10 mg.
Riboflavin	10 mg.
Niacinamide	100 mg.
Pyridoxine hydrochloride	2 mg.
Calcium pantothenate	20 mg.
Vitamin B_{12} activity	4 mcg.
Folic acid	1.5 mg.
Menadione (vitamin K analog)	2 mg.

1. Pollack, H., and Halpern, S. L.: Therapeutic Nutrition, Prepared in Collaboration with the Committee on Therapeutic Nutrition, Food and Nutrition Board, National Research Council, Washington, D. C., 1952.

*Trademark for the vitamin-fortified antibiotics provided by Pfizer

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(Continued from page 366)

What is a Scientist?

Dentists like to think of themselves as white robed disciples of the disciplines of science. We like to believe that our applied science in dental practice has evolved from the fundamental biologic and physical sciences. We believe in precise methods, in accurate measurements, in controlled experimentation, in careful documentation, in looking at the facts even if they offend our preconceptions.

This portrait of ourselves is romantic but not always quite true. We are not always these analytic minds detached from emotion. In fact we seldom are but maybe that is just as well. Here is what a scientist (Hugh L. Dryden in *Science*) has said on the subject:

"The contributions of science not only have included the devising of powerful tools for altering the physical environment of man but also have made major contributions to our spiritual life. Science places a high premium on intellectual honesty and on objective truth, truth that can be tested by any man in any age. Science recognizes no arbitrary authority. It does not accept the laws of gravitation because of the authority of Isaac Newton. The laws of gravitation can be observed and demonstrated as a part of anyone's experience. The ethical ideals of the scientists are high. By the efficient tool of the human intellect, he has penetrated the mysteries of the material universe and freed the minds of men from ignorance and superstition. The successes of science and their impact on every aspect of life have captured the imagination and loyalties of many men as the only guide to truth.

"But science is a partial view of life, in many respects a narrow view. There is often no more naive or gullible individual than the scientist outside his own laboratory and discipline. He tends to develop a myopic vision, and to the layman his interest seems to be in details remote from what most people consider the real interests and concerns of life.

"Look at an all-too-common incident of life. A child dashes to the street; there is a shriek of brakes, a cry, and a small body lying in the street. The mother comes running, moaning, wringing her hands, tears streaming from her eyes. How does science describe this event? The physicist may compute the momentum and energy of the car, the forces exerted in the collision, the shock-absorbing quality of human tissue, the strength of bones. He may measure the intensity and frequency spectrum of the various sounds or the rate of generation of tears in the eyes of the mother. The chemist may analyze the tears and reveal the exact proportion of salt in the water which is their main constituent. He may describe in exact scientific language the fibers of the handkerchief that the mother uses to absorb the tears. The medical specialist may describe the nature of each injury and identify the one that made death inevitable. Surely each of these is an incomplete view, although accurate and true. Surely each specialist confining his activities to those of his science misses the larger aspects of the event.

"The cold sharp tools of science have not been effective in penetrating the area of human emotions, purposes, and values. 'It is the Nemesis of the struggle for exactitude by the men of science,' remarked the biologist, H. S. Jennings, 'that leads him to present a mutilated, merely fractional account of the world as a true and complete picture.' 'You can no more analyze these imponderables by scientific methods' said Eddington, 'than you can extract the square root of a sonnet.' Science advances by purposely

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taking a limited and incomplete view of complex events.

"The scientist has come to realize that outside of his laboratory he is a man like other men, with human passions and shortcomings as well as noble aspirations and high ideals. If you have doubt of this, I suggest that you read at least some of the 992 pages of testimony in the Oppenheimer hearing. To paraphrase Shylock, as did Ley in his scientist's code of ethics: Hath not a scientist eyes? Hath not a scientist hands, organs, dimensions, senses, affections, passions? Fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer, as other men are? If you prick us, do we not bleed? If you tickle us, do we not laugh? If you poison us, do we not die? And if you wrong us, shall we not revenge? If we are like you in the rest, we will resemble you in that.

"Scientists, as well as others, have come to realize that atrophy of the moral and spiritual life is inconsistent with well-rounded development. Man's life at its fullest is a trinity of activity —physical, mental, and spiritual. Man must cultivate all three if he is not to be imperfectly developed. Even after thousands of years of education and religious heritage, we see far too many of our fellow human beings living the life of animals with sole interest in the physical and sensual and exhibiting primitive minds and souls. We find a few religious fanatics who are creatures of instinct and emotion with no guidance from reason. We find many who worship reason and the intellectual life, who appear to normal men as egotistical, selfish, and soulless mechanisms. Scientists in their professional activity elevate the faculty of reason, raising it from the elemental reasoning of animals to lofty creative genius. But to cultivate reason alone and exalt it to a religion or philosophy is as monstrous as to cut off one's arm or to destroy sight and hearing. For the area of human emotions, desires, purposes, values, feelings of beauty and ugliness, love and hate, also can ascend from beastly emotionalism to lofty dreams and aspirations.

"The responsibilities of scientists for the proper use of scientific knowledge for human welfare are thus the same as those of other citizens, no more, no less. Scientists and other citizens look to the wisest among us, whether scientist, humanist, statesman, or bishop, for leadership in solving the difficult problems of meeting this joint social responsibility. We demand of these leaders not only intelligence to consider and integrate the specialized knowledge of all the arts and professions but high moral and spiritual standards as well."

When you sit at an editor's desk it is a good place to observe the "human passions and shortcomings as well as the aspirations and high ideals."

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end to all tooth decay. On the other side are those who speak of the fluoride advocates as some part of a world-wide communistic conspiracy. Unfortunately, we find dentists in both camps of violent emotion. Neither is the scientific approach.

There is nothing about a dental degree or license that ensures that its owner is free of crackpotness. No more than there is insurance against alcoholism or dengue fever from being the owner of a dental degree. We have had erected for us in dental college and have perpetuated the pleasant myth ourselves that there is something unique about one who has been indoctrinated into scientific method. So long as we cherish this little fantasy of superiority within ourselves we suffer from nothing worse than a mild delusion of grandeur. When we let it bubble over from our psyche and enter the world of practical affairs where it may show up as pomposity or conceit or superiority we may expect resistance and disagreement from our neighbors.

People have no objection to our speaking with authority within the field of our competence. When a scientist speaks outside the field of science, in fact, outside his own little subdivision of the field he has no reason to receive any extra consideration from his neighbors nor should his words have any more weight than those of any other reasonably intelligent person.

We sometimes confuse our big words with great thoughts or exalted emotions. When a scientist, and this includes a dentist, deliberately uses big or fancy words to impress or deflate the other fellow he is a coward. People may be awed by our verbal skill but they do not like or respect such trappings of superiority. The great scientists like the late Albert Einstein are warm human beings. I know, for I have an unsolicited and unexpected letter from him written in simple words and honest style that I count among my prized ownings.

—E.J.R.

The American Institute of Dental Medicine

THE NEXT annual meeting will take place at the Desert Inn, Palm Springs, California, October 23 to 27, 1955. The faculty will consist of:

Maury Massler, D.D.S., M.S., University of Illinois, Chicago: Effects of filling materials on the pulp; Sterilization of dentin; Tissue changes during aging.

Valy Menkin, M.D., Temple University Medical School, Philadelphia, Pennsylvania: Inflammation, bacterial invasiveness and immunity; Chemical factors liberated by injured cells in inflammatory exudates; The anti-inflammatory problem with particular emphasis on the mechanism concerned, as induced by corticosteroids.

Hans Selye, M.D., University of Montreal, Montreal, Canada: Recent progress in the study of stress as applied to dental medicine.

Reidar F. Sognnaes, D.M.D., Ph.D., Harvard School of Dental Medicine, Boston, Massachusetts: Relative significance of cellular and chemical remodeling of bones and teeth as revealed by radio-active isotopes; The complexity of the caries problem suggested by recent observations in experimental animals; The clinical implications of experimental caries research.

Wendell L. Wylie, D.D.S., University of California, San Francisco, California: Tooth guidance and factors influencing the rate of eruption.

All Seminar lecturers will participate in a round table forum discussing the application of their subjects to the practice of dental medicine. Applications and full information may be secured from the Executive Secretary, Miss Marion G. Lewis, 2240 Channing Way, Berkely 4, California.

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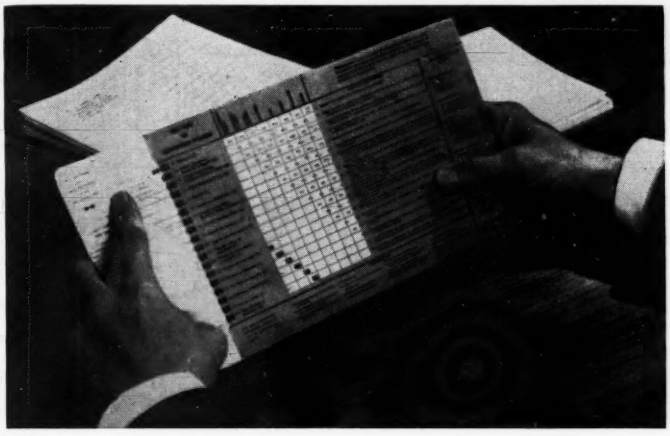

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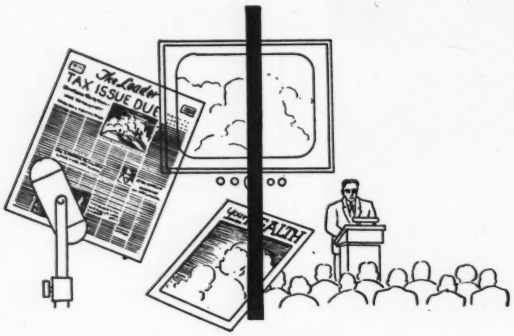

If Dental Advertising Is Wrong. Is Publicity Right?

"Only dentistry can tell its own story authoritatively," says M. A. Patrick. While medicine has become a popular subject for magazine and newspaper articles, radio and television programs—and even for a best-selling novel, dentistry has avoided the limelight. Yet millions of people now unaware of the need for dental care—or fearful of seeking it—might be greatly benefited by a program of "ethical publicity" which would stress rudimentary dental health facts and allay groundless fear and apprehension. Dentistry has an important story to tell. Why not tell it?

★ ★ ★

"It is difficult to argue with success—and even more difficult to question the sizable financial returns from multiple cavity preparations made possible by the use of general anesthetics," says Doctor Allan J. Wintner. Yet, as he points out, "The bringing of a human being to that state in which life in so many ways resembles death is at no time a fool's occupation." You will want to read the article, "Flight into Anesthetic Sleep."

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We all know that it is necessary to protect our families with insurance. We may not fully realize that we *should* protect them in other ways as well. A dental practice presents rather unusual problems to heirs or administrator. The wise dentist will, early in his career, take the seven safeguarding steps that Doctor Leo B. Dillon describes.

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One of the happiest chapters of dental history is being written in Lane County, Oregon. Doctor Glen L. Purdy, editor of the local dental society publication, tells how the Elks Lodge (Number 357) of Eugene, Oregon, has made it possible to provide "Cooperative Dental Care for Indigent Children." May other organizations throughout the country follow the example of this truly Benevolent and Protective Order!

★ ★ ★

Doctor Howard E. Kessler, dentofacial speech consultant for the Cleveland Public School System, and a trustee for the Cleveland Hearing and Speech Center of Western Reserve University, presents a challenge to the profession in his article, "Improving Speech—Dentistry's Opportunity."

★ ★ ★

"How does Stress Tend to Produce Illness?" Doctor Lawrence E. Hinkle Jr., of Cornell University answers the question after studying a survey of 1300 women telephone operators.

★ ★ ★

"Wilbur" is still giving sage advice—and receiving no thanks for it—in the series of articles by Doctor Robert P. Stickley. Don't miss his latest conversation on the subject of budgets.

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